FOREST PEST CONDITONS IN CALIFORNIA–1992

A Publication of the California Forest Pest Council

THE CALIFORNIA FOREST PEST COUNCIL

The California Forest Pest Council (formerly the California Forest Pest Control Action Council) was established in 1951. Membership is open to public and private forest managers, foresters, silviculturists, entomologists, pathologists, zoologists, and others interested in the protection of forests from damage caused by animals, disease, insects, and weeds. The Council's objective is to establish, maintain, and improve communication among individuals—managers, administrators, and researchers—who are concerned with these issues. This objective is accomplished by four actions:

1. Coordination of detection, reporting, and compilation of pest damage information.
2. Evaluation of pest conditions.
3. Pest control recommendations made to forest management agencies and landowners
4. Review of policy, legal, and research aspects of forest pest control, and submission of recommendations thereon to appropriate authorities.

The California Board of Forestry recognizes the Council as an advisory body in forest pest protection. The Council is a participating member in the Western Forest Pest Committee of the Western Forestry and Conservation Association.

This report, **FOREST PEST CONDITIONS IN CALIFORNIA - 1992,** is compiled for public and private forest land managers to keep them informed of pest conditions on forested land in California, and as an historical record of pest trends and occurrences. The report is based largely on information provided by four sources: (1) the state-wide Cooperative Pest Survey, in which federal, state, and private foresters and land managers participate, (2) information generated by Forest Pest Management, Pacific Southwest Region, USDA-Forest Service, while making formal detection surveys and biological evaluations, (3) reports and surveys of conditions on private lands provided by personnel of the California Department of Forestry and Fire Protection, and (4) surveys and detections of the California Department of Food and Agriculture.

This report was edited, published and distributed by the California Department of Forestry and Fire Protection with the cooperation of the Council's Standing Committees.

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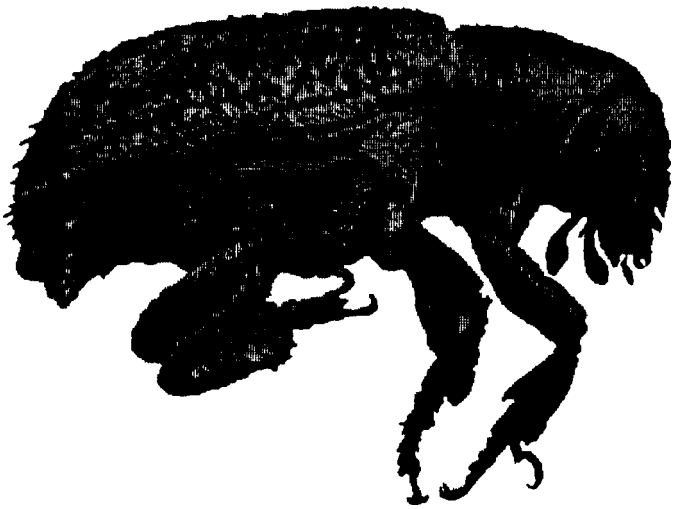


JOHN DALE, CHAIR
JEANETTE NEEDHAM, SECRETARY

STATUS AND CONTROL OF INSECTS

WESTERN PINE BEETLE, *Dendroctonus brevicomis*.

North Coast. Mortality of ponderosa pine was noted in scattered trees at the Baxter Ranch northeast of Ukiah and in large (25+) groups on Asa Bean Ridge, northeast of Covelo (both Mendocino County). The Hoberg area (southwest Trinity County) and Boggs Mountain (Lake County) had scattered mortality.

Northern. Ponderosa pine mortality caused by drought and western pine beetle increased in 1992. Some limited areas of moderate to heavy pine mortality occurred in the vicinity of Soldier and Saddle Mountains near Burney (Shasta County), and just south of Day (Modoc and Shasta Counties). Heavy mortality was observed on the Mendocino National Forest near Sugarfoot Glade, and on the south-facing slope of Thomas Creek near Devil's Basin, both in Tehama County. Heavy mortality was also noted along McAdam Creek, north of Fort Jones, and also along the I-5 corridor southwest of Yreka in Siskiyou County. Ponderosa pine mortality was evident by early spring in the Mud Flow Research Natural Area near McCloud, Siskiyou County. Both drought and blackstain root disease contributed to stress on the trees in the Mud Flow area. Small groups of old growth ponderosa pine mortality, often mixed with sugar pine or Douglas-fir mortality, were common on dry, side ridges along the Klamath and Scott Rivers, Siskiyou County. Scattered old growth ponderosa pine were killed by drought, overstocking, and western pine beetle west of Poison Lake, Lassen County. Scattered old growth ponderosa pines on Timber Mountain, Modoc County, were killed by western pine beetle. There is considerable ponderosa pine mortality on Timber Mountain, but most of it is a result of direct mortality from fire scorch, or attacks by mountain pine beetle or California flatheaded borer.

Sierra. Western pine beetle/drought related mortality continued at above normal levels during 1992 throughout most of the lower to mid-elevation westside pine and mixed conifer stands. Mortality was noted as occurring in isolated, scattered, small group-kills (trees) and also extensively within specific drainages. Mortality of groups of varying size was particularly heavy in the American Camp and Ruby Hill areas (Miwok Ranger District) and in the Manuel Compartment (Calaveras Ranger District), Stanislaus National Forest; in the Jose Basin and around Oakhurst (Pineridge Ranger District), Sierra National Forest; and in the Colony Mill Ridge and Milk Ranch areas in Sequoia-Kings Canyon National Parks. Mortality occurred extensively throughout drainages around McKenzie Ridge (Hume Lake Ranger District) and Breckenridge Mountain (Greenhorn Ranger District), Sequoia National Forest. Pine mortality in Yosemite National Park was reported to have increased dramatically in 1992, and to be higher than that which occurred during the drought of 1976-77.

Southern California. Tree mortality associated with the western pine beetle and other pine feeding scolytids was reduced compared to previous years. For example, 1992 mortality on the San Jacinto Ranger District (San Bernardino National Forest) is estimated to be less than 20% of mortality levels in the late 1980s, while on the Palomar Ranger District (Cleveland National Forest) mortality is only slightly less. The western pine beetle was involved in the mortality of some fire injured ponderosa pine on the 1200 acre Stockton Fire on the Cajon Ranger District (San Bernardino National Forest, San Bernardino County), and with a group-kill of stagnating Coulter pine on the Tujunga Ranger District (Angeles National Forest, Los Angeles County). Significant rainfall occurred in March of 1991, and precipitation was very heavy in southern California in the winter of 1991-92. Favorable soil moisture levels and previous mortality of many susceptible trees may be responsible for the lower mortality levels observed this season.

PINE ENGRAVER BEETLES, *Ips* spp.

North Coast. As with the western pine beetle, pine engraver activity was observed in scattered mortality or top-kill of ponderosa pine on the Baxter Ranch, and in large group kills on Asa Bean Ridge (Mendocino County). Several pockets of knobcone pine on Konocti Mountain in Lake County were killed. Pine engravers continued to attack pitch canker-stressed Monterey pines in Alameda County (Hayward) and Santa Cruz County (several areas).

Northern. *Ips mexicanus* continued to kill old knobcone pine located near Lake Siskiyou and on McCloud Flats, Siskiyou County. Some ponderosa pine tops were killed by pine engraver beetles in the southern end of the Scott River Valley, Siskiyou County. There was a spot of mortality caused by *Ips pini* near Blacks Mountain Experimental Forest, Lassen County, which was associated with logging slash. *Ips paraconfusus* and to a lesser extent the western pine beetle were responsible for ponderosa pine mortality near Hayfork (Trinity County).

Sierra. Pine engraver activity was scattered throughout much of the pine and mixed conifer types and continued to be evident on the west side of the Sierra Nevada. Attacks by pine engraver beetles were often noted in association with western pine beetle in ponderosa pine. Several scattered pole-size ponderosa were killed by pine engravers in the Wire Corral area (Calaveras Ranger District) on the Stanislaus National Forest.

Southern California. Engraver beetles were abundant in slash on the San Bernardino National Forest (San Bernardino County), but top-kill of nearby trees was not observed, perhaps because of the favorable growing conditions. A similar situation occurred on the Mt.

Pinos Ranger District (Los Padres National Forest, Kern County), where infested slash was not associated with subsequent damage to living trees.

However, *Ips paraconfusus* was associated with high mortality in a 20 acre, 10-year-old Coulter pine plantation growing off-site on Mount Palomar (Cleveland National Forest, San Diego County).

Ips confusus continued to contribute to mortality of singleleaf pinyon infected with black stain root disease in the San Bernardino Mountains.

FIR ENGRAVER, *Scolytus ventralis.*

North Coast. Scattered mortality of white fir occurred in portions of Mendocino, Lake, and Humboldt Counties. Incidence is much lower than in 1990 and 1991 in the more coastal areas of the region.

White fir mortality was higher than normal in the interior, but still tended to be scattered. Extensive areas of top-kill and branch flagging were visible near the crest of the Coast Range in areas such as Cherry Lake and Government Flat along the Trinity-Tehama County boundary.

Northern. The most active bark beetle within the region was the fir engraver beetle, which continued to be responsible for extensive mortality of true firs on eastside sites from southern Lassen County to Lake Tahoe within the established North Sierra Zone of Infestation (State of California). The most dramatic increase in true fir mortality, however, was documented during an aerial survey that included portions of Lassen, Modoc, Shasta, and Siskiyou Counties. Lassen County in particular has heavy mortality in the area from Blacks Mountain east to Eagle Lake and south to Fredonyer Pass and Hamilton Mountain. Heavy fir mortality has been noted at Fredonyer Pass on Highway 36. Mortality and top-kill is visible from Highway 44 on many of the peaks in the western half of Lassen County such as Roop Mountain, Round Valley Butte, Bogard Butte, and Poison Butte.

In Modoc County, mortality is heaviest in the southwest corner of the county in the vicinity of Big Valley and Jimmerson Mountains, although significant mortality occurs in true fir habitat elsewhere. Top-kill of white fir is heavy in the Roney Flat-Higgins Flat area north of Adin.

Numerous white fir in a band between 4,000 and 5,000 feet elevation on the south and east sides of Mt. Shasta faded and became visible from Interstate 5 and Highway 89 during the summer. White fir mortality is common in the northwest and eastern portions of Lassen Volcanic National Park, and also near the Tamarack trailhead to the Thousand Lakes Wilderness, Shasta County.

True fir mortality was visible from the air in the rain shadow areas along the eastern edge of the Russian Wilderness and Marble Mountains Wilderness in western Siskiyou County. A white fir stand located approximately 5 miles northeast of Fort Jones had 19% of the stand killed by 1991 fir engraver attacks, and an additional 51% of the stand under attack during 1992. In eastern Siskiyou County, true fir mortality is moderate to locally heavy, particularly north and east of Pondosa where fir engraver attacks made in 1991 killed about one-third of the white fir in an area of about 85,000 acres.

Eastside forests have received very little precipitation during the past two winters, with the 1991/92 water year being particularly poor. Since true fir mortality detected this spring and summer largely represents fir engraver activity in 1991, it is reasonable to predict that true fir mortality seen next spring will be even higher. True fir mortality in excess of 50% is not uncommon on some of the most heavily impacted sites.

Sierra. True fir mortality associated with the fir engraver appeared to remain at above normal levels in isolated areas in westside mixed conifer and true fir stands. Mortality was extensive on the Eldorado National Forest in the Echo Summit and Matulich areas (Placerville Ranger District); Bell Mountain (Miwok Ranger District), Stanislaus National Forest; Milk Ranch and Mineral King areas in Sequoia-Kings Canyon National Parks; and on Breckenridge Mountain (Greenhorn Ranger District), Sequoia National Forest. Extensive areas of old and current fir mortality continue to be evident throughout the Lake Tahoe Basin.

As a result of engraver attacks during 1991, the frequency of top-kill was above normal on the Eldorado and Stanislaus National Forests during the spring of 1992. Top-kill was scattered throughout the mixed conifer and true fir types.

Fir mortality in Yosemite National Park was reported to have increased dramatically in 1992, and to be higher than that which occurred during the drought of 1976-77.

Within the North Sierra Zone of Infestation a notable increase in true fir mortality was seen in the Dixie Valley/Frenchmen Lake area of south east Plumas County.

Southern California. Mortality of white fir associated with this insect appears to have increased in the vicinity of Mt. Palomar (San Diego County).

RED TURPENTINE BEETLE, *Dendroctonus valens.*

North Coast. Several Monterey pines with pitch canker were killed by red turpentine beetles in Santa Cruz and Alameda Counties. In addition, other drought-stressed Monterey pines throughout the region were killed by this beetle. At least two dozen Monterey pines were killed at the fairgrounds in Ukiah.

Northern. Much of the ponderosa and Jeffrey pine mortality seen in northern California this year involved heavy attacks by the red turpentine beetle. Even the mortality of large saplings on the Hat Creek Plateau, which is commonly assumed to be caused by pine engraver beetles, was actually a result of attacks by red turpentine beetle and California flatheaded borer. It was common to find large trees completely girdled by tur-

pentine beetle from below the ground line on the major roots, to as much as 10 feet above the ground. Some attacks produced only dry granular frass, rather than pitch tubes.

Sierra. Attacks by red turpentine beetle continued to be common on ponderosa pine, frequently in association with the western pine beetle. Attacks in pole-size ponderosa pines were common in the Sawmill Mountain area, Groveland Ranger District, Stanislaus National Forest, and in the Jose Basin, Pineridge Ranger District, Sierra National Forest. The Sequoia National Forest reported considerable red turpentine beetle activity in sugar pine.

MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae.*

Northern. Mortality varied by host tree species. Lodgepole pine mortality has been slowly increasing around meadows on the Goosenest Ranger District, Klamath National Forest, for several years. Mountain pine beetle continues to kill lodgepole pine near Eiler and Barrett Lakes in the Thousand Lakes Wilderness, Shasta County. Some ponderosa pine on Timber Mountain in Modoc County has been attacked by mountain pine beetle. Several years of drought, several years of black pineleaf scale infestation, and a 1,400 acre fire during the summer of 1992 have all contributed to the mortality on Timber Mountain. The mountain pine beetle also caused mortality to some sugar pine infested with black pineleaf scale on Jimmerson Mountain (Modoc County). However, sugar pine mortality usually was caused by drought and mountain pine beetle attacks and was widely scattered across northern California.

Sierra. Mortality of sugar pine caused by mountain pine beetle appeared to decline throughout the westside of the Sierra Nevada during 1992 when compared with the last two years. Mortality occurring in individual and groups of sugar pine was noted along Highway 168 to Tamarack Ridge (Pineridge Ranger District), Sierra National Forest.

DOUGLAS-FIR BEETLE, *Dendroctonus pseudotsugae.*

North Coast. Attacks on scattered black stain infected trees occurred primarily in Jackson Demonstration State Forest, Mendocino County. A build-up of beetles in blowdown led to attacks of several trees in a two-acre mixed conifer stand near Crannell, Humboldt County.

Northern. A few infested trees were found along Camp Creek, below the Methodist Camp on the Mt. Shasta Ranger District in Siskiyou County. Old age, and severe dwarf mistletoe infestation played major roles in the death of these trees. At least one tree was infested with Douglas-fir beetle in a summer home tract on the east shore of Lake Pillsbury, Mendocino National Forest. The infested tree was in a mixed group of dead and declining Douglas-fir and California black oak. The infested Douglas-fir had a mycelial fan of Armillaria root disease under the bark at the root crown.

JEFFREY PINE BEETLE, *Dendroctonus jeffreyi.*

Northern. Scattered old growth Jeffrey pines have been killed along Highway 89 in Shasta County, outside the Lassen Volcanic National Park entrance, as well as inside the Park from Manzanita Lake to Upper Kings Creek Meadow. A Jeffrey pine beetle infestation near the Tamarack trailhead to the Thousand Lakes Wilderness has been killing trees for several years. The old growth Jeffrey pine overstory is beginning to become depleted. A few small groups of older Jeffrey pines growing on lava flows near Pole Springs, Lassen County, were killed, and a large group of old Jeffrey pine was killed by Jeffrey pine beetle near the south end of Ashurst Lake, Lassen County. Numerous green attacked trees, as well as dead trees which had not faded, were detected in the same area in September of 1992. Severe drought and a dense understory of white fir contributed to the mortality.

Sierra. Above normal levels of Jeffrey pine mortality were reported from the California side of the Lake Tahoe Basin, while some very heavy mortality has occurred on drier sites on the Nevada side.

SPRUCE BEETLE, *Dendroctonus rufipennis.*

North Coast. No further mortality pockets were noted in areas surrounding last year's group mortality near Patrick's Point State Park in Humboldt County.

ROUNDHEADED FIR BORER, *Tetroplum abletis.*

Northern. Red fir mortality caused by drought-stress and roundheaded fir borer infestation was common in Lassen Volcanic National Park, Shasta County, and particularly visible along Highway 89 inside the Park from about Summit Lake to Emerald Lake. Red fir mortality caused by roundheaded fir borer was low to moderate on the Goosenest Ranger District, Siskiyou County, in the area between Chandler Glade and Ball Mountain. White fir mortality on the eastern part of the Goosenest Ranger District, from about Blue Canyon to Medicine Lake, was light, but many trees have incipient infestations of roundheaded fir borer.

Sierra. This woodborer was commonly found in association with the fir engraver in white fir mortality throughout the westside mixed conifer and true fir types.

FIR FLATHEADED BORER, *Melanophila drummondi.*

North Coast. Borers attacked hundreds of drought-stressed Douglas-firs and/or Douglas-firs infected with Armillaria or black stain disease in southwestern Trinity, southeastern Humboldt, and northeastern

Mendocino Counties. Incidence appears comparable to last year.

Sierra. This woodborer was commonly found in association with the fir engraver in white fir mortality throughout the westside mixed conifer and true fir types.

DOUGLAS-FIR ENGRAVER, *Scolytus unispinosus*

North Coast. Incidence of attacks is down region-wide from previous years.

CALIFORNIA FLATHEADED BORER, *Melanophila californica*

Northern. Drought stress has been severe enough in northern California that most dead and dying pines have evidence of infestation by California flatheaded borer. California flatheaded borer was commonly encountered in dying ponderosa pine which had been stressed by several years of black pineleaf scale infestation near the intersection of State Highways 299 and 89 in eastern Shasta County. California flatheaded borer was common in several fresh slash piles being monitored for the development of *Ips pini* broods on the Hat Creek Ranger District, near the Shasta-Lassen County line. Feeding by flatheaded borer larvae reduced the brood success of *Ips pini*.

CEDAR BARK BEETLES, *Phloeosinus* spp.

North Coast. Both redwood and Port-Orford-cedar were killed or top-killed following buildup of beetles in blowdown at the edge of a clearcut near Crannell, Humboldt County.

AMETHYST CEDAR BORER, *Semanotus amethystinus*

Northern. Amethyst cedar borer was common in dead and dying Port-Orford-cedar on the east side of the Sacramento River near Conant and Sweetbriar, Shasta County. The trees were growing in a thin layer of soil over bedrock adjacent to the river. Drought has apparently reduced the amount of soil moisture available to some trees. Port-Orford-cedar root disease was not found in the area.

EUCALYPTUS LONGHORNED BORER, *Phoracantha semipunctata.*

North Coast. A bluegum with characteristic galleries and pupal chambers was found along Arastradero Road in Palo Alto. This tree was located in a stand of approximately 100 dead and/or declining bluegums. Frost damage was a factor in the decline. This report probably is part of the infestation that has occurred the past few years on the Stanford University campus. The University has removed and chipped many dead trees, and has thinned overstocked areas to relieve stress on leave trees. Parasite release programs are planned for the Stanford area.

ROOT COLLAR WEEVIL, *Pissodes* sp.

North Coast. A few hundred Bishop pine saplings or small poles were killed in the Sprowel Creek area of Humboldt County by a root collar weevil, likely Pissodes radiata, and roundheaded borers (as yet unidentified).

CALIFORNIA OAKMOTH, *Phryganidia californica.*

North Coast. Larval feeding continues to cause defoliation of coast live oak in a few locales in Santa Cruz County. Flights of this insect were noted in the Stanford University arboretum (San Mateo County) and near Piercy in Northern Mendocino County.

GYPSY MOTH, *Lymantria dispar.*

California. Detections in 1992 remained at low levels (Tables 1 & 2). One of the detections did occur at a rural forest location (Table 2). Six specimens from various locations have been submitted for mtDNA analysis, which separates Asian gypsy moths from European (eastern North America) gypsy moths. In 1992, no moths from anywhere in the United States has as yet been identified as the Asian strain.

TABLE 1. CALIFORNIA GYPSY MOTH SITUATION - 1992

Year	Traps Placed	Adults Trapped	Counties	Properties with viable egg mass/ pupal cases	Sites Treated
1984	30,000	25	9	2	5
1985	28,000	28	10	3	2
1986	27,000	20	9	1	0
1987	19,000	6	5	1	1
1988	20,000	13	6	0	0
1989	21,000	56	14	2	0
1990	21,000	24	8	0	1
1991	21,000	7	5	1	0
1992	22,644[a]	9	9	0	0

a. 4321 traps placed for asian gypsy moth

TABLE 2. LOCATION OF GYPSY MOTHS CAUGHT IN CALIFORNIA IN 1992

County	Location
Los Angeles	Lancaster (East 6th St.)
Sacramento	Sacramento ("U" St.)
San Diego	Carlsbad (Redwing St.)
San Francisco	San Francisco (Dolores St.)
San Bernardino	
Santa Barbara	Lompoc (Hazelnut St., Vandenberg AFB)
Santa Clara	Campbell (McBain Ave.)
Stanislaus	Turlock (Montana Ave.)
Tuolumne	Sweetwater Campgrnd, Stanislaus N.F.

OREGON.[b]

Status at the Beginning of the 1992 Survey Season. "In 1991, approximately 15,445 traps were placed statewide. Twenty-nine gypsy moths (including one Asian gypsy moth) were detected, all in western Oregon. Six moths were detected on Elder Mountain near Cave Junction (Josephine County). Five hundred and forty-two acres were treated there in 1992. In response to the single Asian gypsy moth detected in 1991, 8,400 acres in North Portland were also treated as part of a cooperative USDA-APHIS, USFS, and ODA eradication, exclusion and detection program. Both eradication programs consisted of three applications of **B.t.k.** (0.5 gla/24B.I.U./acre, Foray 48B ™) applied by helicopter and took place during April-May."

1992 Gypsy Moth Survey Program. "Forty-seven gypsy moths have been detected at eight new and three old sites in Oregon in 1992 (Table 3). All forty-seven gypsy moths detected in 1992 were submitted to the USDA Otis Methods Development Center for wing morphometric and DNA analysis to determine whether they are of the Asian or European strain. To date all gypsy moths submitted have been identified through DNA analysis as the European strain. Two moths still await positive identification."

"No gypsy moths were detected in or near the Elder Mountain eradication area near Cave Junction (Josephine County). No moths were found at Sam's Valley (Jackson County) or Selma (Josephine County) in southern Oregon where two moths were found last year at each site. Four other sites in the greater Portland area where single detections were made in 1991 were also negative in 1992. No gypsy moths were detected in Lane County where over 19,000 gypsy moths were detected in 1984, resulting in the largest gypsy moth eradication program in the western U.S. during 1985-1988."

TABLE 3. SUMMARY OF 1992 GYPSY MOTH DETECTIONS IN OREGON [b]

County	City/Area	Site Status	# GM's	Trap Density per mile^2
Benton	Philomath	New	18	1-2 (increased)
Clackamass	Lake Oswego	Old	2	49 (increased)
	SW Portland [c]	Old	2	49
	West Linn	New	2	16 (increased)
	Oregon City	New	1	16 (increased)
Clatsop	Astoria	New	1	16
Lincoln	Seal Rock	New	1	1-2 (increased)
Marion	Aurora	Old	3	49
Multnomah	Lewis & Clark College[c]	Old	6	49 (increased)
	SW Portland[c]	Old	1	49
	NE Portland	New	1	16 (increased)
	Holbrook	New	6	16
Washington	Beaverton	New	3	16 (increased)
Statewide total			**47**	

b. Submitted by Alan D. Mudge, Oregon Department of Agriculture, 635 Capitol St. NE, Salem, OR 97310-0110, November 6, 1991. Taken whole, or in part, from: Mudge, A. D. and Kathleen J.R. Johson. 1992. Gypsy Moth Detection, Eradication, and Exclusion Programs in Oregon. Unnumbered report, Oregon Dept. Agr. 6 p.

c Indicates detections are in the same general area.

"At three sites where moths were found in 1991, fourteen moths were found again in 1992. Two moths were found in adjacent traps in Lake Oswego (Clackamas County) where four moths were found in 1991; three moths were found in Aurora (Marion County) where four moths were found in 1991; and nine moths were found in southwest Portland where five moths were found in 1991. The detections in Lake Oswego and Aurora are virtually identical areas as those in 1991 as are seven of the nine detections in southwest Portland. The intensive trapping in all these areas in 1992 has helped to delineate affected areas and identify likely points of introduction."

"Approximately 12,844 gypsy moth traps were placed statewide in 1992. Early detection of new introductions continues to be the main focus of the detection program in order to keep eradication programs as small as possible. Traps were concentrated in western Oregon where most population centers and gypsy moth host material are located. However, all cities and towns statewide are considered at risk and are trapped each year. The standard detection trap density is 1-4 traps per square mile. Special sites such as state and national parks, public and private campgrounds and RV parks are also trapped."

"Delimitation traps are placed at densities of 16-49 traps per square mile for four or more square miles. They are placed to monitor sites where detections were made the previous year and to monitor the success of eradication programs. Delimitation traps were also placed as soon as possible following initial detections to delimit any new infestations the same year. A total of approximately 11,732 and 1,112 delimitation traps were placed statewide in 1992."

Potential Eradication Programs in 1993. "Thirty-three detections this year are likely to be the result of new introductions and not related to previous finds. Literature distribution and information gathering regarding recent move-ins from the northeastern U.S. and subsequent egg mass searching is underway at all detection sites. Eradication programs proposed for 1993 would be based on the results of detection data and egg mass searching in those areas. The biological insecticide **B.t.k.** applied by ground or air has been used successfully in all eradication programs since 1984. Other pilot eradication techniques such as sterile insect release or application of NPV gypsy moth virus may also be considered on a site by site basis if available for use in 1993."

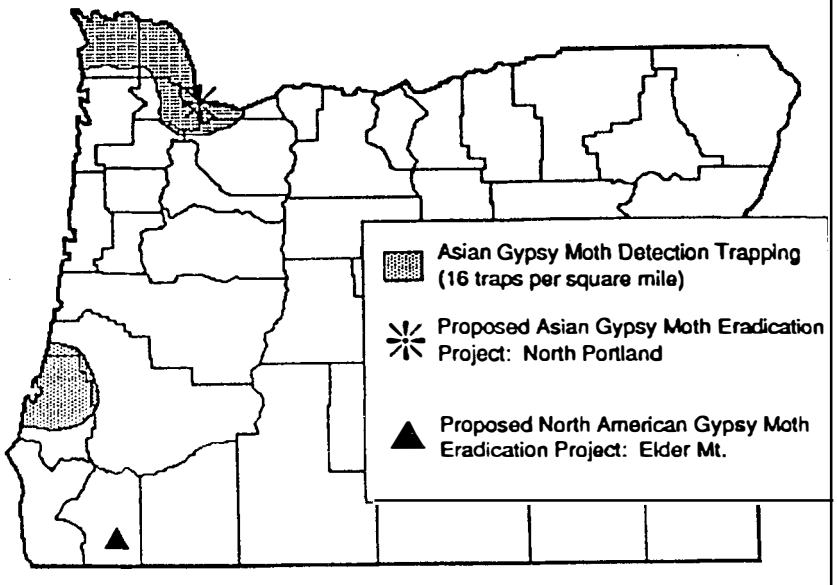
Asian Gypsy Moth Eradication, Detection and Exclusion Programs. "The detection of Asian gypsy egg masses on ships originating in eastern Russian ports and of Asian gypsy moth adults for the first time in North America in 1991 prompted a three pronged reaction to this potentially serious pest: 1) eradication of all current infestations, 2) extensive detection surveys in areas exposed to Asian gypsy moth, and 3) exclusion/inspection of ships at risk of transporting Asian gypsy moth. In Oregon these programs were cooperative efforts by USDA-APHIS, USFS, and ODA."

"The detection of a single adult Asian gypsy moth in north Portland in 1991 resulted in 8,400 acres in north Portland being treated by helicopter with three spring applications of **B.t.k.**, a biological insecticide. The eradication program was challenged in U.S. District Court on April 17 and 29, 1992, by a citizens group "Bug Off", the Northwest Environmental Defense Center, and three citizens opposed to the eradication program on the basis of alleged NEPA violations and concerns about human health effects of **B.t.k.** In both cases the motion for an injunction was denied. The judge found no significant health risks and enormous potential for damage by AGM. The eradication program proceeded as planned."

"An extensive detection program consisting of sixteen traps per square mile was established for twenty miles inland along the Columbia River from Astoria to Portland, around the Ports of Portland and Coos Bay, and around the 1991 positive detection sites (Figure 1). Approximately 37,014 Asian gypsy moth traps were placed in Oregon in 1992. Forty-five of the 47 gypsy moths detected have been identified through DNA analysis as European. Two moths still await positive identification. No gypsy moths were detected within the Asian gypsy moth eradication area in north Portland in 1992. Asian gypsy moth traps will remain in the field until early next summer when they will be replaced with a new trap for the 1993 survey season."

"Guidelines for identifying and inspecting ships at risk for Asian gypsy moth that were developed by USDA-APHIS were implemented and remain in effect. These

FIGURE 1. THE GYPSY MOTH IN OREGON, 1992.



policies have reportedly been successful in deterring high-risk ships from entering U.S. ports as relatively few high-risk ships have entered North American ports this year. Asian gypsy moth populations are also on the decline in eastern Siberia port areas thus helping to reduce the threat of new introductions. On October 26, 1991, an egg mass of an exotic Lymantriid species *Lymantria mathura* Moore was collected from a Russian ship while docked in Portland, OR. *L. mathura* is widely distributed in Asia (Japan, Korea, Siberia, China, India) and is similar in appearance and habits to *L. dispar* (L.). This is the first indication that species other than *L. dispar* may be introduced via this route."

FRUITTREE LEAFROLLER, *Archips argyrospila.*

Southern California. Significant defoliation of California black oak and some defoliation of coast live oak was observed in the San Bernardino Mountains.

TENT CATERPILLAR, *Malacosoma* sp.

Sierra. Tent caterpillar populations in Inyo and Mono Counties remained at low levels in 1992.

A CALIFORNIA SPRUCE BUDWORM, *Chorlstoneura carnana californica.*

Northern. The last visible defoliation of Douglas-fir by this budworm occurred in Trinity County in 1985.

DOUGLAS-FIR TUSSOCK MOTH, *Orgyia pseudotsugata.*

North and Sierra. The 1992 data from Douglas-fir tussock moth early warning system verified that populations throughout California remained at low, non-damaging levels with the exception of three areas in the northern part of the state. Three plots located a few miles west of Goose Lake, Modoc County, had above normal levels of moths caught in the traps. In addition, sing le p lots located near Fredony er Pass, Lassen

TABLE 4. NUMBER OF DOUGLAS-FIR TUSSOCK MOTH PHEROMONE DETECTION SURVEY PLOTS BY TRAP CATCH, 1979 TO 1992.

Year	Total # of Plots	NUMBER OF PLOTS WITH AN AVERAGE MOTH CATCH PER TRAP OF:													
	⇓	<10	<20	<25	<30	<35	<40	<45	<50	<55	<60	<65	<70	<75	>75
1979	102	97	2	1	1	0	1	0	0	0	0	0	0	0	0
	100%	95%	2%	2%	2%		2								
1980	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0
	100%	100%													
1981	93	78	10	4	1	0	0	0	0	0	0	0	0	0	0
	100%	84%	10%	4%	2%										
1982	95	93	1	0	1	0	0	0	0	0	0	0	0	0	0
	100%	98%	1%		1%										
1983	98	87	6	1	1	3	0	0	0	0	0	0	0	0	0
	100%	89%	6%	1%	1%	3%									
1984	111	51	18	11	5	7	8	4	3	4	0	0	0	0	0
	100%	46%	16%	10%	4%	6%	7%	4%	3%	4%					
1985	105	58	14	4	7	6	5	1	2	4	1	2	0	1	0
	100%	55%	13%	4%	7%	6%	5%	1%	2%	4%	1%	2%		1%	
1986	107	64	16	4	8	6	1	3	0	1	0	1	1	1	1
	100%	60%	15%	4%	7%	6%	1%	3%		1%		1%	1%	1%	1%
1987	108	80	15	4	2	1	1	3	0	1	0	0	1	0	0
	100%	74%	14%	4%	2%	1%	1%	3%		1%			1%		
1988	124	105	9	3	3	0	2	1	0	0	0	0	0	0	0
	100%	86%	7%	2%	2%		2%	1%							
1989	130	129	1	0	0	0	0	0	0	0	0	0	0	0	0
	100%	99%	1%												
1990	138	135	1	0	1	1	0	0	0	0	0	0	0	0	0
	100%	97%	1%		1%	1%									
1991	143	135	4	1	0	0	2	1	0	0	0	0	0	0	0
	100%	94%	3%	1%			1%	1%							
1992	159	151	3	0	2	1	0	0	0	0	1	0	1	0	0
	100%	95%	1%		1%	1%					1%		1%		

County and around Burney Mountain, Shasta County, had increases over last year's trap catch. Larval populations in these areas will be monitored in the spring of 1993. Table 4 (above) gives the number of detection survey plots by level of average moth catches for 1979 to 1992.

MODOC BUDWORM, *Choristoneura retiniana.*

Northern. Populations of this budworm expanded unexpectedly to epidemic levels in Modoc County in northeastern California where 80,000 acres of white fir were defoliated. About 26,000 acres were classified by aerial and ground surveys as heavily defoliated.

SEQUOIA PITCH MOTH, *Synanthedon (Vespamima) sequoiae.*

North Coast. This insect continues to be a pest of ornamental Monterey pine throughout the region. Many infested trees are attacked by the red turpentine beetle.

Southern California. A pitch mass borer similar to the Sequoia pitch moth caused light damage on old growth Jeffrey pine in San Bernardino County.

A GELECHIID LEAF SKELETONIZER, *Chionodes trichostola.*

Northern. This leaf skeletonizer caused damage to blue oak in the northern Sacramento Valley (Shasta and Tehama Counties) again this year at a level higher than was seen in 1991. The difference in damage between 1991 and 1992 could very well be due to late winter and early spring weather conditions. This year's weather was relatively dry throughout larval development, while March of 1991 was exceptionally wet, potentially having a negative impact on early larval instars. The outbreak started in 1990, the worst year for defoliation.

GRASSHOPPERS, Acrididae.

Southern California. Grasshopper populations were high on the Cleveland National Forest (San Diego County) and appeared to be in the early stage of outbreak, thus higher populations are expected next year. Seedling Engelmann and coast live oaks were defoliated on the Palomar Ranger District. Most of these seedlings appear to be recovering from the damage. Other damage was to range grasses, causing concern among grazing permittees.

Significant populations were not observed this year in the San Bernardino Mountains, the San Gabriel Mountains, and other areas observed in 1992.

FALL WEBWORM, *Hyphantria cunea.*

North Coast. Webbing and associated defoliation of Pacific madrone was observed in several areas of Santa Cruz County, and to the north in Sonoma, Mendocino, and Humboldt Counties. Some areas of Mt. Sanhedrin (Lake County) are severely infested.

Northern. Webbing on Pacific madrone was common along the Klamath and Trinity River corridors, Siskiyou and Trinity Counties.

WHITE FIR SAWFLY, *Neodiprion* spp.

Northern. Elevated populations of white fir sawflies were observed in the CalPines subdivision, Modoc County, and defoliation by white fir sawflies was visibly heavy in several areas in Lassen County. The white fir sawflies, *Neodiprion* nr. *deleoni* and *N. abietis*, are in outbreak at scattered locations between Eagle Lake and Lake Almanor (Lassen and Plumas Counties). Heavy defoliation on private forest land also was reported near Roop Mountain and Big Merrill Flat. This is the second year that defoliation was noted in the Merrill Flat area (Lassen County). Defoliation is more or less limited to the older foliage of sapling and pole-size white fir trees, although the lower crowns of some mature trees are noticeably defoliated in areas where populations are high. The current year's growth remains largely untouched. Defoliation was also visible on Swain Mountain Experimental Forest. All size classes were fed upon, but defoliation was most severe on understory trees. Drought conditions exist in outbreak areas and may, in combination with the defoliation, lead to tree mortality, although this has not yet occurred.

Sierra. Defoliation was reported from a dense stand of true fir with scattered western white pine, Downieville Ranger District, Tahoe National Forest.

A MINDARUS TWIG APHID, *Mindarus* sp.

Northern. Studies of suppression techniques applicable in beds of true fir seedlings were completed at Placerville Nursery. An integrated pest management approach appears applicable for reducing and maintaining damage to acceptable levels. A study of the growth and survival of outplanted seedlings with variable amounts of feeding damage has progressed into its second year. Work continues on the exact identification of the aphid.

BLACK PINELEAF SCALE, *Nuculaspis californica.*

North Coast. This scale infested sugar pine west of Laytonville, Mendocino County (see Pine Needle Scale).

Northern. Black pineleaf scale continued to infest ponderosa pine over an area of many square miles in the vicinities of Highway 299 and the Pittville Road, and Highways 299 and 89, Shasta County. Damage, in the form of shortened, yellowish needles, and poor needle retention, has worsened this year. Some ponderosa pine mortality from the western pine beetle was noted at both locations, and mortality in these areas was higher than in similar uninfested areas. High populations of

this scale also caused defoliation of ponderosa pine on Timber Mountain (Modoc County).

Black pineleaf scale infestations were also locally heavy in sugar pine, for example near Pondosa (Siskiyou County) and on Jimmerson Mountain (Modoc County). Some mortality from mountain pine beetle has occurred in association with these infestations. Although the scale is often most damaging in the upper crown of sugar pine, numerous trees were noted on Jimmerson Mountain with severe infestations/damage throughout their crowns.

Sugar pine to the south and west of Mt. Shasta, Siskiyou County, remained infested with black pineleaf scale. Many sugar pine had little foliage in the upper crowns due to defoliation caused by high scale populations.

A small number of sugar pine remain infested at the Foresthill Seed Orchard, Tahoe National Forest. The infestation is confined primarily to branches below 15 feet, with few scales found above this height.

Sierra. Moderate to heavy black pineleaf scale infestations on sugar pine were reported on the Eldorado and Stanislaus National Forests, and on Summit Level Ridge (Calaveras County). Poor needle retention and chlorotic foliage were attributed to increasing number of the scales in the upper one-third of the crown of many trees.

A single homozygous rust resistant sugar pine tree on the Pacific Ranger District (Eldorado National Forest) was treated with carbaryl insecticide during May of 1992 to reduce the scale population level.

TABLE 5. LODGEPOLE NEEDLEMINER POPULATION DENSITY, TUOLUMNE MEADOWS REGION, YOSEMITE NATIONAL PARK[d]

	Live Needleminers per 100 Tips - July				
Plot	**1986**	**1988**	**1990**	**1992**	**% Change, '90 '92**
Upper Tenaya	16	12	30	32	+ 6.7
Cathedral Cr. W.	6	4	8	28	+ 250.0
Cathedral Cr. S.	28	6	12	18	+ 50.0
Cathedral Cr. E.	14	4	6	10	+ 66.7
May Lake	76	66	216	1222	+ 465.7
Doug Lake	42	38	34	22	- 35.3
West Lyell	2	2	4	8	+ 100.0
Kuna	6	10	14	32	+ 128.6
average	23.7	17.7	40.5	171.5	+ 323.5
Budd Creek	24	4	4	98	+ 2350.0
Cathedral Lake	43	20	64	68	+ 6.2
Dingley Creek	32	10	8	16	+ 100.0
Delaney Creek	30	34	62	48	- 22.6
Dana Meadow	18	6	4	12	+ 200.0
average	27.6	14.8	28.4	48.4	+ 70.4
Olmstead #1	66	266	448	2216	+ 394.6
Olmstead #2	40	38	12	98	+ 716.7
Murphy Cr. W.S.	76	44	16	34	+ 112.5
Lower Tenaya	2	16	4	6	+ 50.0
Mt. Hoffman	38	28	34	46	+ 35.3
Bear Pits	6	10	8	36	+ 350.0
average	38.0	67.0	87.0	406.0	+ 366.7
Lembert Dome	14	6	6	18	+ 200.0
Campground	4	6	6	2	- 66.7
Plot G	8	4	4	14	+ 250.0
Plot H	6	14	2	16	+ 700.0
Base Camp	4	14	ND	30	+ 100.0
Plot A	6	8	8	4	- 50.0
Plot O	ND	ND	2	8	+ 300.0
Tenaya Beach	2	64	42	50	+ 19.0
Tenaya P.A.	28	42	116	102	- 12.1
average	8.0	17.5	20.7	27.1	+ 30.9

d. Printed by permission of Resource Management, Yosemite National Park and Dr. Tom Koerber, Entomological Services, Berkeley, CA. Note: This survey has provided an annual record of quantitative data for approximately three decades.

ND None detected.

LODGEPOLE NEEDLEMINER, *Coleotechnites milleri.*

Sierra. The 1992 survey of lodgepole needleminer populations in the Tuolumne Meadows Region of Yosemite National Park indicated a sharply rising trend (Table 5). Warm dry weather during the reproductive phase of the needleminer life cycle in the summer of 1991 favored successful establishment of the new generation. A mild winter allowed a high proportion of the newly established larvae to survive the winter.

In most of the area covered by the survey the needleminer population is still too low to cause visible defoliation. However, two plots, May Lake and Olmstead #1, have extremely high population densities. These are the westernmost plots in the survey area and represent an area comprised of Snow Flat and the surrounding slopes. The needleminer populations at these sites far exceed the number required to completely defoliate the trees and severe defoliation may occur by the end of the summer of 1992. Adult needleminers spreading from the heavily infested area should be expected to establish greatly increased populations to the east and northward during the next flight period in 1993. Non-host forest types to the west and south preclude spread in those directions.

CONIFER APHIDS, *Cinara* spp.

Northern. A team of scientists involved in an international effort to locate parasites of the cypress aphid, *Cinara cupressi*, made collections in several locations in California this year. Aphids were collected from MacNab cypress, *Cupressus macnabiana*, in Butte and Shasta Counties, and also from Baker cypress in eastern Shasta County. The team also spent time collecting aphids from Monterey cypress and Monterey pine in the San Francisco Bay Area.

SPRUCE APHID, *Elatobium abietinum.*

North Coast. Continued attacks keep spruce foliage sparse on planted and native Sitka spruce along coastal Humboldt County. Damage is about the same as 1991.

GOUTY PITCH MIDGE, *Cecidomyia pinnlopsis.*

Northern. Tip flagging on ponderosa pine was very evident in the Railroad Plantation near Hambone, Siskiyou County. This 30-year-old plantation has a long history of infestation by the gouty pitch midge. Tip flagging caused by gouty pitch midge was also common along the Edson Creek Road between the Coonrod Flat Road and Highway 89. Both planted and natural ponderosa pine ranging in size from seedlings to pole-size trees were infested. Drought stress may have increased the number of tips which died from infestation.

MATSUCOCCUS SCALE, *Matsucoccus* sp.

North Coast. A small number (12-14) of ponderosa pine in and around Loch Lomond (Lake County) had branch flagging similar to that caused by this scale. The health of these trees has been followed for the past few years, and none has been successfully attacked by bark beetles.

PINE NEEDLE SCALE, *Chionaspis pinifoliae.*

North Coast. Moderate populations of the pine needle scale, and lesser amounts of the black pineleaf scale, were infesting sugar pine west of Laytonville, Mendocino County. Native predators, such as larvae and adults of the twice-stabbed lady beetle, *Chilocorus bivulnerus*, were well represented on the infested trees.

BLUE GUM PSYLLID, *Ctenarytaina eucalypti.*

California. By May 31, 1992, there were nine new county records for the bluegum psyllid in California.

FIGURE 2. Distribution of the bluegum psyllid, *Ctenarytaina eucalypti*, in California, May 31, 1992. (By permission of Dr. Raymond J. Gill, editor, California Plant Pest and Disease Report, a publication of the California Department of Food and Agriculture.)

The psyllid was found for the first time at the L.A. Moran Reforestation Nursery in Davis. The present distribution is given in Figure 2.

ASH WHITEFLY, *Siphoninus phillyreae.*

California. The program of releasing parasites and predators of this exotic whitefly appears to be gaining success in the suppression of this new pest.

FORMOSAN TERMITE, *Coptotermes formosanus.*

Southern California. This serious termite pest was found for the first time at a California residence in the La Mesa area, San Diego County. A visual survey on adjacent properties found Formosan termites in wood piles and in live California pepper trees on three properties. No Formosan termites were found in home structures other than the initial site. Control treatments have been initiated and delimitation surveys are in place (California Plant Pest & Disease Report, 11(1-2), 1992, p. 4).

RED IMPORTED FIRE ANT, *Solenopsis invicta.*

Southern California. Collections of this serious ant pest have been made in nursery situations in Riverside and San Diego Counties. Eradication and further investigation are in progress (California Plant Pest & Disease Report, 11(1-2), 1992, p. 10).

AFRICANIZED HONEY BEE, *Apis mellifera scutellata.*

Southern California. The northward movement of populations have now brought this bee close to the California-Mexico border. Nine counties in Texas have reported infestations. Officials of the African Bee Program in Mexico report the first fatality in northern Tamaulipas near the town of Valle Hermoso, about 50 miles south of Brownsville, TX (California Plant Pest & Disease Report, 11(1-2), 1992, p. 14).

TABLE 6. INSECTS OF LESSER IMPORTANCE IN CALIFORNIA - 1992

INSECTS Scientific Name	Common Name	Host	WHERE EXAMINED OR REPORTED County	Remarks
Agromyzidae	leafminer fly	BO	Mendocino	This is the fourth consecutive year of galls on black oaks near Ukiah.
Altica ambiens	Alder flea beetle	WA	Trinity	Route 299 from Buckhorn Summit west to Weaverville.
			Tulare	Defoliated alder in lower Peppermint Campground.
Altica sp.	A flea beetle	unknown	Riverside, San Diego	Very heavy flights of metallic green or blue-green flea beetles were observed in Idyllwild and Cuyamaca Rancho State Park.
Andricus crystallinus	Crystalline gall wasp	LO	Nevada	Limited number of hosts.
Cryphalus sp.	Douglas-fir twig beetle	DF	Sonoma	A few densely grown trees in northwest Sonoma County had scattered branch mortality caused by this beetle.
Cylindrocopturus fumissi	Douglas-fir twig weevil	DF	Siskiyou	In branches of plantation trees in blackstain root disease centers, Salmon River R.D.
Dioryctria sp.	A pyralid moth	SP	Shasta & Siskiyou	Boring in blister rust cankers on plantation seedlings.
Eriophyes spp.	A Eriophyid gall maker	AS	Mono	Affected several aspen trees on the Mono Lake Ranger District, Inyo NF.

TABLE 6. (cont.)

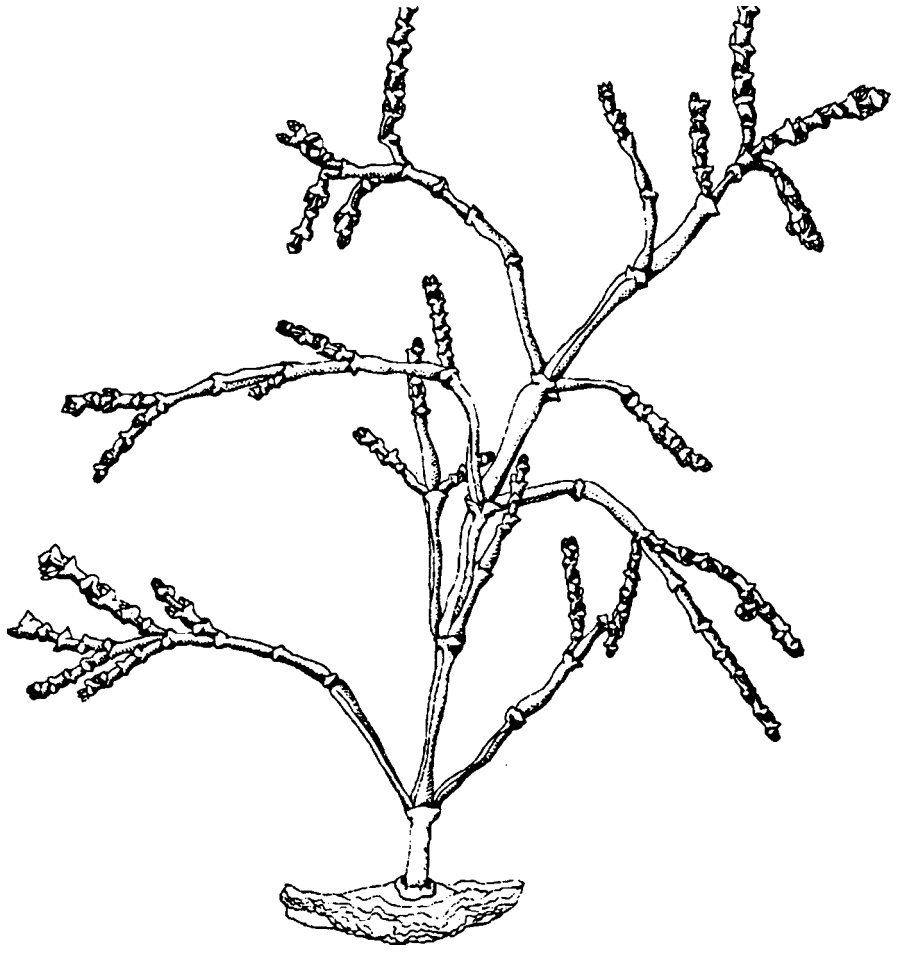
INSECTS Scientific Name	Common Name	Host	WHERE EXAMINED OR REPORTED County	Remarks
Halisodota argentata	Silverspotted tiger moth	DF	Trinity	Scattered defoliation of individual branches, Hayfork and Weaverville Ranger Districts.
H. argentata		WF	Siskiyou	Top branches of white fir.
Hylastes nigrinus		BP	Humboldt	Found in the Sprowel Creek area.
Hylurgops porosus		BP	Humboldt	Found in the Sprowel Creek area.
Neodiprion sp.	Pine sawfly	JP	Siskiyou	Apparently the second year of defoliation on large saplings in a plantation near the Everett Memorial Highway.
		MP	Humboldt	Eight 15- to 20-year-old pines were defoliated in the Clark's Butte area.
Pityophthorus sp	a twig beetle	JP	Ventura	Slight damage to saplings in a plantation on Frazier Mtn.
Susana cupressi	Cypress sawfly	CM	Butte	On foliage; no visible defoliation.
Tropidosteptes sp.	Ash plant bug	FV	Kern	Caused leaves to curl and die on two ash trees at the Kernville Ranger Station.
Unknown	Roundheaded borer	BP	Humboldt	Infested bolts in rearing. Associated with root weevils.
Unknown	Spider mites	CW, WL	Yolo	L.A. Moran Reforestation Center.

HOST ABBREVIATIONS

AS = Aspen
BO = Black oak
BP = Bishop pine
CM = MacNab cypress
CW = Cottonwood
DF = Douglas-fir
FV = Modesto ash
JP = Jeffrey pine
LO = Live oak
MP = Monterey pine
SP = Sugar pine
WA = White alder
WF = White fir
WL = Willow spp.

STATUS AND CONTROL OF DISEASE

A REPORT TO THE CALIFORNIA FOREST PEST COUNCIL FROM THE DISEASE COMMITTEE



JESS RIOS, CHAIR
JACK MARSHALL, SECRETARY

STATUS AND CONTROL OF DISEASES

ABIOTIC DISEASES

Drought. Moisture stress brought on by drought has continued to be a primary cause of tree mortality throughout California. Levels of mortality are higher in most areas, with all tree species being affected to some extent. White fir mortality has been especially severe in the eastside pine and mixed conifer sites of northeastern California and in stands around Mt. Shasta. Mortality of sugar pine throughout northern California has also been high.

The drought induced moisture stress has caused the decline of coast redwoods growing on shallow and/or well-drained soils in interior redwood fringe areas in Mendocino County. Needles are extremely shortened and have been for the past few years on the interior site trees; however, this year the trees have taken on a red appearance when viewed from a distance. The needles are mottled with a necrotic speckling, but no biotic agents seem to be associated with the pattern.

Hardwoods are also being affected by the moisture stress. Many dead tanoak and chinquapin were observed in the Bluff Creek Drainage of the Orleans Ranger District, Six Rivers National Forest (Humboldt County). *Armillaria* mycelial fans were present under the bark of the dead trees, but were considered to be secondary. District personnel have also noted high mortality levels in willows throughout the district and attribute it to the combined effects of moisture stress and *Armillaria*.

Scattered branch dieback was noted on numerous canyon live oaks (*Quercus chrysolepis*) near Junction City (Trinity County), including a tree that at one time was thought to be the largest canyon live oak in existence. The injury is likely due to lack of water, although the anthracnose fungus *Gleosporium quercinus* was isolated from some of the twigs.

Dieback of manzanita (largely *Arctostaphylos visscida*) is occurring at scattered locations west of Redding and into the Whiskeytown National Recreation Area (Shasta County). Most plants show a partial dieback starting with foliage at the top and moving downward. Moisture stress is presumed to be the primary cause, although infection by the canker fungus *Botryosphaeria* sp. is also a contributing factor.

Temperature Extremes. Winter desiccation is being blamed for top kill on hundreds of ponderosa pine seedlings in plantations on the Goosenest Ranger District, Klamath National Forest (Siskiyou County) and Mt. Shasta Ranger District, Shasta-Trinity National Forests (Siskiyou County). The desiccation was a result of low snow pack along with drying winds during the winter of 1991-92.

Rising soil temperatures due to geothermal activity may explain damage observed at two different locations totaling 40 acres on the Mammoth Ranger District, Inyo National Forest (Mono County). Severe needle loss and mortality first appeared in 1989 on lodgepole pine, red fir, western white pine, and mountain hemlock. No pathogens or insects were found that would explain the appearance of identical symptoms on four different conifer species. It is speculated that a higher soil temperature is damaging the roots of these species.

FOLIAGE DISEASES

Needle Casts. Spring rains in northern California in 1991 produced conditions conducive to a moderate level of foliage diseases. A low level of *Rhabdocline weirii* occurred on Douglas-fir saplings and poles along the road to Castle Lake on the Mt. Shasta Ranger District, Shasta-Trinity National Forests (Siskiyou County).

Sugar pine needle cast (*Lophodermella arcuata*) was widespread on sugar pine over several hundred acres of private mixed conifer forest north of Latour State Forest (Shasta County). Sugar pine needle cast was also widespread throughout the crowns of all size classes of western white pine north and west of Castle Crags and along the upper Sacramento River (Shasta and Siskiyou Counties). Sugar pine needle cast has not previously been reported on western white pine in California (see Diseases of Pacific Coast Conifers, 1978).

Naemacyclus infections on Monterey pine appear to have decreased along coastal Mendocino County where infections occurred last year.

Other. Sycamore anthracnose (*Apiognomonia veneta*) was observed on California sycamore in a stand of sycamore and valley oak near the Red Bluff Diversion Dam (Tehama County), and on black oak in Butte County. Late spring rains may have been responsible for incidence of anthracnose on black oak between Ukiah and Boonville, Mendocino County. Two fungi recovered were *Cylindrosporium* sp. and *Apiognomonia* sp.

Several big leaf maples near Piercy and Highway 101 (Mendocino County) were infected with the speckled tar spot fungus, *Rhytisma puntatum*.

NURSERY DISEASES

Seedlings grown at the Humboldt Nursery (Humboldt County) were injured or killed by a number of diseases. *Fusarium* spp. killed red and white fir that were planted into unfumigated ground. *Phoma* was also isolated from declining seedlings and contributed to this loss of hundreds of thousands of seedlings.

1-1 Douglas-fir transplants had stunted, chlorotic tops and poor root systems after transplanting. Extremely high levels of *Pythium* were found on seedling roots. The decline was brought on by prolonged storage with excess soil packed with the roots. Twenty percent of the transplants died but 80% recovered and returned to good health.

Gray mold (*Botrytis* sp.) caused mortality and dieback of giant sequoia, and redwood, and loss of lower need-

les in Douglas-fir. Trials were done this year to determine efficacy of fungicidal alternatives to Benlate for gray mold control. The ornamental label for Benlate was withdrawn by DuPont in September, 1991.

Cedar leaf blight, caused by *Didymascella (Keithia) thujina*, caused shotholing and defoliation on western red cedar seedlings at levels greater than 1991.

Humboldt is expanding its product line with more deciduous trees and seedlings which are hosting more broadleaf pests. Powdery mildew was severe on big leaf maple seedlings. Alder seedlings were infected with Septoria leaf spot (*Septoria alnifolia*) and a rust. The *Septoria* infection caused some stunting, mortality and leaf spotting. The rust caused plants to lose their leaves approximately one month earlier than usual. Surrounding alder trees in the nursery vicinity were also infected with the rust.

At the Chico Tree Improvement Center (Butte County) approximately 400 3-yr-old sugar pine being grown in 3-gallon containers died due to Fusarium root disease.

At Magalia Nursery (Butte County), losses to *Fusarium* in red and white fir and sugar pine ranged between 1 and 3 percent; there were no substantial losses in other species. Charcoal root rot (*Macrophomina phaseoli*) caused about a 5 percent loss of giant sequoia seedlings.

At the Ben Lomond Nursery (Santa Cruz County), *Phytophthora* caused losses of about 5 percent in Douglas-fir bed areas with poor drainage. Sugar pine seed were eaten by various bird species even though netting and scare tactics were employed. Hypocotyl rot, mostly due to *Fusarium oxysporum*, accounted for mortality of 20-30% of 1-0 sugar pine, red fir, and white fir seedlings at the nursery.

ROOT DISEASES

Annosus Root Disease. Annosus root disease, caused by *Heterobasidion annosum*, was killing ponderosa and Jeffrey pine seedlings in several plantations on the Scott River Ranger District, Klamath National Forest (Siskiyou County). The stands had been harvested about 10 years ago and planted in 1983 or 1984. Relatively low levels of the disease were also reported on the Milford Ranger District, Plumas National Forest (Plumas County). The disease remains of concern in the eastside pine type stands.

Black Stain Root Disease. Black stain root disease (*Leptographium wageneri*) was again commonly reported in many areas of northern California in plantations and natural stands of Douglas-fir. It was identified in a plantation on the Gasquet Ranger District, Six Rivers National Forest (Del Norte County) that had been precommercially thinned in 1983. The fungus was also killing Douglas-fir in a plantation on the Salmon River Ranger District, Klamath National Forest near China Gulch (Siskiyou County). Black stain root disease was identified in older stands on the Gasquet and Orleans Ranger Districts, Six Rivers National Forest (Del Norte and Humboldt Counties). The stand on the Gasquet District had been commercially thinned in 1982 by tractor and yarder. Various stages of crown decline were apparent. The stand on the Orleans Ranger District was second growth Douglas-fir that regenerated following a fire and had not previously been entered. Both stands are about 70 years old. A pocket of three infected Douglas-fir was also noted in Boggs Mountain Demonstration State Forest (Lake County) in an area where the disease had not previously been recorded.

A ponderosa pine seedling was found to have black stain root disease on the McCloud Ranger District, Shasta-Trinity National Forests on McCloud Flats (Siskiyou County). The seedling was near a ponderosa pine stump. It was not possible to determine if the harvested tree had been infected before being felled. The fungus was active in surrounding stands. Several black stain centers were observed in ponderosa pine stands near Deadwood Conservation Camp (Siskiyou County) on the Scott River Ranger District, Klamath National Forest. A high incidence of black stain root disease on ponderosa pine was associated with unusual soil disturbance on portions of the Stateline Sale, Devils Garden Ranger District, Modoc National Forest (Modoc County). The disease was observed at several new locations on the Big Valley Ranger District, Modoc National Forest (Modoc and Lassen Counties).

Armillaria Root Disease. *Armillaria* sp. caused decline and mortality of Douglas-fir in a summer home tract and nearby bald eagle management area on the east side of Lake Pillsbury, Mendocino National Forest (Lake County). Examination of the root collars of these trees revealed necrosis and resinosis along with mycelial fans of the fungus. California black oak stumps or dead trees were usually also present within these centers. Armillaria root disease was also found in conjunction with scattered tanoak mortality in Mendocino County.

Port-Orford-Cedar Root Disease. The range of Port-Orford-cedar root disease (*Phytophthora lateralis*) did not expand significantly in the past year. It remains limited to the Smith River Drainage in northwestern California.

Other. Extensive heart and root rot of coast live oak, *Quercus agrifolia*, was observed at Oak Flat and Blue Point Campgrounds on the Ojai Ranger District, Los Padres National Forest (Ventura County). *Ionotus dryadeus* and *I. andersonii* were tentatively identified from samples collected.

CANKER DISEASES

Pitch Canker. Pitch canker, caused by *Fusarium subglutinans*, continues to flag Monterey pine in both Santa Cruz and Alameda Counties. Some of the moderately to heavily infected trees have been killed by pine engraver beetle and/or red turpentine beetles. A resurvey of the

disease was undertaken throughout California to see if locations of known infestation had expanded. Extensions of several miles from known infestations were found in Oakland and Alameda. Pitch canker was confirmed for the first time from Marina and Ft. Ord (Monterey County), in new locations (near Highway 1) in Monterey, and along Highway 1 a mile or two north of the previously known infections in the city of Santa Cruz. The infestation in Santa Barbara has spread out a short distance from the area of infestation found in 1989. The disease has increased in severity in the Christmas tree farm in Torrance that was found to be infested in 1988. A Christmas tree farm 1 mile away was surveyed without finding pitch canker. The south coast between Los Angeles and San Diego was surveyed for pitch canker; no diseases of any kind were found.

Other. A shoot dieback on sugar pine and western white pine was common throughout northern California. Dieback was noted on sugar pine on the Weaverville Ranger District, Shasta-Trinity National Forests (Trinity County). Isolations from the margin of dieback on twigs of western white pine growing near Castle Lake (Siskiyou County) yielded at least four unidentified fungi. Isolations from the shoots of western white pine growing near Tamarack Lake (Shasta County) yielded *Epiccocum* sp. and another unidentified fungus. Dieback was frequently associated with insect damage or other wounds, but was also observed on twigs that did not appear wounded. The fungi isolated do not fit the descriptions of any known pathogens of 5-needled pines, and are presumed to be opportunistic agents involved due to the extreme stress of six years of drought.

Cypress canker, caused by *Seridium cardinale*, seems to have intensified during the drought period in many dryland ornamental Monterey cypress in Mendocino County.

Branch and stem infections, caused by *Botryosphaeria ribis*, continued to kill branches and tops of giant sequoia planted at low elevation dry sites. Infections have been noted in Napa, Sonoma, Mendocino, and Humboldt Counties.

Branch mortality of a few Douglas-fir near Redwood Valley, Mendocino County, was caused by *Phomopsis lokoyae*.

Madrone canker, caused by *Fusicoccum* sp., seems to be very prevalent in most counties in the north coastal area.

MISTLETOES

Dwarf mistletoes remain widespread, but their distributions have not changed significantly in recent years. Their effect on trees, however, has changed as the drought continues. This is especially true of white fir dwarf mistletoe (*Arceuthobium abietinum* f.sp. *concoloris*) in northern California, which is commonly associated with branch flagging and tree mortality caused by the fir engraver beetle, *Scolytus ventralis*.

Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*) was reported on Douglas-fir near Crater Creek (Siskiyou County) and along the Deer Lick Springs Road (Trinity County).

Western dwarf mistletoe, *Arceuthobium campylopodum*, continues to be of concern on ponderosa pine at Boggs Mountain Demonstration State Forest (Lake County) and on private property near Kettenpom (Trinity County).

RUST DISEASES

White Pine Blister Rust. Low levels of blister rust, *Cronartium ribicola*, were observed on *Ribes* sp. throughout northern California early in the season, but due to the dry conditions, levels did not build up during the summer. In the north coastal area, the disease remains static on sugar pine in the area of Mt. Sanhedrin (Lake County). Two pole-sized trees were killed about 10 miles northeast of Anchor Bay (southwestern Mendocino County). Evaluation of progeny test sites and other plantations on the Klamath, Plumas, Tahoe, and Eldorado National Forests indicated a high incidence of 1989 infection. Cankers had developed and in many cases pycnia and aecia had been produced. In the Central Sierra, newly flagged branches with blister rust infections dated to 1988 and 1989 were found. Severity of disease occurrence in Mountain Home Demonstration State Forest (Tulare County) was masked by the severe losses of sugar pine to mountain pine beetle.

Spraying of blister rust resistant trees with carbaryl continued in 1992 on Mountain Home and Latour (Shasta County) Demonstration State Forests and on the Mendocino, Stanislaus, and Tahoe National Forests. 170 resistant and candidate resistant trees were treated on each of the State Forests, with trees on Mountain Home DSF receiving two sprays and those on Latour DSF one. Nine resistant trees on the Mendocino, 33 on the Stanislaus, and 15 on the Tahoe National Forest were sprayed. Surrounding trees were also sprayed. In addition, surrounding trees on the Mendocino were thinned, and deep watering was administered to each resistant tree. To date all treated trees on state and federal lands are alive.

Rust-Resistant Sugar Pine Screening Program

Workers screening for major gene resistance (MGR) of 128,000 seedlings from 1350 candidate sugar pine selections identified 96 new rust resistant parents in 1991-92. Seventy-four resistant trees are on the Eldorado (7), Plumas (27), Sequoia (12), Sierra (14), Stanislaus (1), Tahoe (3), Klamath (1), Lassen (8), and Six Rivers (1) National Forests. Twenty-two are on state and private lands. 800 families are scheduled for MGR screening in 1992-93.

9600 seedlings from 205 non-MGR families from the northern province were inoculated during November to screen for slow rust resistance. After inoculation the see-

dlings will be transplanted to a 5-acre site near Placerville along Highway 50. In addition, there are now 14,132 MGR seedlings at Happy Camp to be screened for slow rust resistance. Seedlings transplanted in 1986 and 1987 were inspected in April.

Western Gall Rust. Western gall rust, caused by *Endocronartium harknessii*, continues to cause branch mortality and stem cankers in several pine species. The disease has caused increased branch flagging of Bishop pine and Monterey pine along northern Sonoma and southern Mendocino County coastlines.

DUTCH ELM DISEASE

In 1992, Dutch elm disease, *Ceratocystis ulmi* (DED), was found to have spread within, between, and outside of areas where it had been previously found. Sacramento had five new DED sites, and the disease appeared in Solano County (Vallejo) for the first time in six years (Table 7). New sites in outlying areas include Sacramento, Rio Linda, Vallejo, Marinwood, eastern Concord, and southeastern Oakland. As of October 15, 1992, 288 elm trees from nine counties in California were confirmed for the disease. This is the highest number of positive trees since 1985, and the second highest in project history.

The record number of positive disease identifications in 1985 was largely accounted for by confirmation of 65 trees on a single street in Larkspur (Marin County). The last two years' high totals are not as easily explained, but may be related to budget reductions in 1988 and 1992 which resulted in long delays in diseased tree removals, elimination of disease-exposed tree removed, reduced frequency and extent of survey, elimination of elm wood pick up, and sampling of only the most symptomatic elms.

1992 budget cuts led to suspension of California Department of Forestry and Fire Protection Forest Pest Management Program operations in nine Bay Area counties on September 25. The Sacramento field office and the Santa Rosa field office and diagnostic laboratory will remain in operation; however, the Palo Alto and San Ramon (Bollinger Canyon) offices have been closed. Remaining staff will be available on a limited basis to provide information, sampling, and field and laboratory diagnosis of pest problems.

TABLE 7. NUMBER OF TREES CONFIRMED WITH DUTCH ELM DISEASE [a]

COUNTY	1985	1986	1987	1988	1989	1990	1991	1992
Alameda	0	11	7	3	3	23	28	26
Contra Costa	21	30	35	35	34	38	29	23
Marin	154	125	83	91	82	46	56	62
Napa	2	3	2	9	5	4	7	3
Sacramento	0	0	0	0	0	10	7	24
San Francisco	0	0	0	0	0	0	0	0
San Mateo	63	44	47	70	48	60	108	95
Santa Clara	34	41	20	35	32	51	44	29
Solano	0	1	0	0	0	0	0	8
Sonoma	28	14	16	12	3	6	20	18
Totals	302	269	210	255	207	238	299	288

a. The total for 1992 is as of October 15, 1992. All other totals are for the calendar year.

TABLE 8. FOREST DISEASES REPORTED - 1992 [b]

AGENT	HOST	COUNTY
ABIOTIC INJURIES		
Drought	All species	Statewide
Cold temperature injury	DF, SP, PP	Nevada, Siskiyou
BACTERIAL DISEASES		
Bacterial Gall	DF	Plumas
CANKER DISEASES		
Botryosphaeria ribis	GS	Napa, Sonoma, Mendocino, Humboldt
Fusarium subglutinans	MP	Alameda, Los Angeles, Monterey Santa Barbara, Santa Cruz
Epicoccum sp.	WWP	Shasta
Fusicoccum sp.	MA	North coastal counties
Phomopsis lokoyae	DF	Mendocino
Seridium cardinale	MC	Mendocino
FOLIAGE DISEASES		
Apiognomonia veneta	PR	Tehama
Cylindrosporium sp.	BO	Mendocino
Elytroderma deformans	PP, JP	Statewide
Gleosporium quercinus	QC	Trinity
Lophodermella arcuata	SP	Shasta
	WWP	Shasta, Siskiyou
Naemacyclus	MP	Mendocino
Rhabdocline weirii	DF	Siskiyou
Rhytisma puntatum	MM	Mendocino
NURSERY DISEASES		
Botrytis sp.	GS	Humboldt
Fusarium sp.	WF, RF	Humboldt
	WF, RF, SP	Butte
Macrophomina phaseoli	GS	Butte
Phoma sp.	RF, DF	Humboldt
Phytophthora sp.	DF	Santa Cruz

TABLE 8. Forest Diseases (cont.)

AGENT	HOST	COUNTY
PARASITIC PLANTS		
Arceuthobium douglasii	DF	Siskiyou, Trinity
Arceuthobium campylopodum	PP	Lake, Trinity
Arceuthobium abietinum	DF, WF	Northern California
ROOT DISEASES		
Armillaria sp.	CH, TO, WW	Humboldt
	DF	Lake
	TO	Mendocino
Heterobasidion annosum	DF, IC, JP	Plumas
	JP, PP	Siskiyou
Ionotus andersonii		
I. dryadeus	QA	Ventura
Leptographium wageneri	DF	Del Norte, Humboldt, Lake, Modoc,Siskiyou
	JP, PP	Lassen, Siskiyou
Phytophthora lateralis	POC	Del Norte
RUST DISEASES		
Cronartium ribicola	SP	Kern,Lake,Mendocino,Sequoia,
		Shasta, Trininty
Endocronartium harknessii	BP, MP	Sonoma, Mendocino

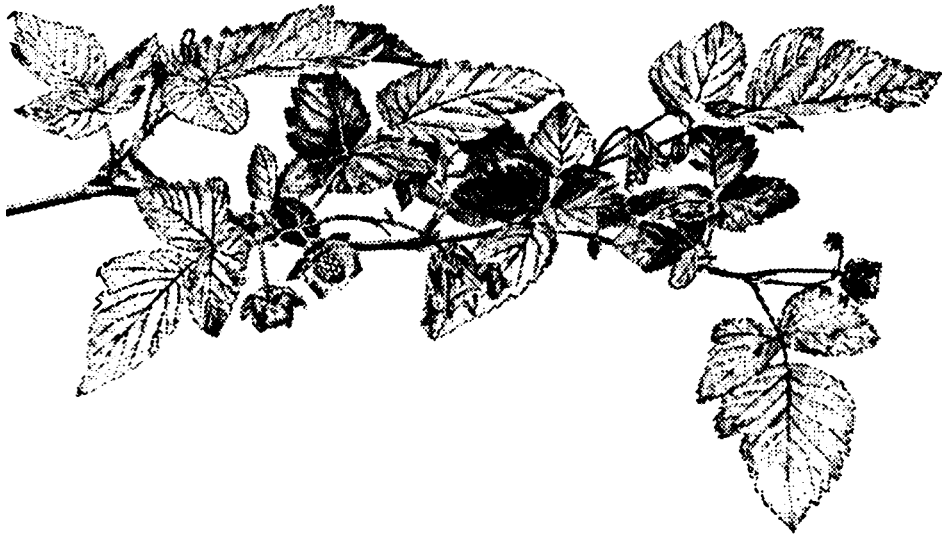
b. Not a complete listing for all locations reported, nor for reports of common diseases.

HOST ABBREVIATIONS

BO = Black Oak
BP = Bishop pine
CH = Chinquapin
DF = Douglas-fir
GS = Giant sequoia
IC = Incense-cedar
JP = Jeffrey pine
MA = Pacific madrone
MC = Monterey cypress
MM = Maple
MP = Monterey pine
POC = Port-Orford-cedar
PP = Ponderosa pine
PR = California Sycamore
QA = Coast live oak
QC = Canyon live oak
RF = Red fir
SP = Sugar pine
TO = Tan oak
WF = White fir
WW = Weeping willow
WWP= Western white pine

STATUS AND CONTROL OF WEEDS

A Report to the California Forest Pest Council from the Weed Committee



GLENN LUNAK, CHAIR
DAVID BAKKE, SECRETARY

STATUS AND CONTROL OF WEEDS

Intensive forest management is based upon the presumption that factors negatively influencing growth and survival of crop trees are controlled or managed to minimize their effects. Towards that aim, control of competing vegetation is a critical part of successful forest management, especially in a Mediterranean climate such as is found in California.

As the public looks towards some form of uneven-aged forest management as the answer to real or perceived problems, there is often the thought expressed that such management methods would eliminate the need for intensive vegetation control. As has been demonstrated at Blodgett Forest and elsewhere, this is certainly not the case; competing vegetation would still be a problem in dealing with survival and growth of either planted or natural conifer regeneration under any type of intensive forest managment.

As was stated at the annual meeting of the Council, the status of forest weeds can be described as follows: they have been a problem, they are a problem, they will continue to be a problem, as long as intensive timber management is practiced.

The 100% pesticide-use reporting requirements by the California Environmental Protection Agency make it impossible to present timely information in this report. As of mid-December, the report of statewide pesticide use for 1991 was not yet complete. Table 9 is based on preliminary data received from the data processing branch of the Pesticide Reporting Unit of Cal EPA. This table shows the herbicides used on all forest lands in the state in 1991, not by acres but rather by pounds of active ingredient applied.

On private forest lands in the state, herbicides continue to be the primary means of controlling competing vegetation. The values in Table 9 reflect a level of herbicide use comparable to that of 1990. Hexazinone and Triclopyr continue to be the herbicides used most often throughout the state on forest lands.

Table 9. Herbicides applied on Forestlands in California in 1991.

Herbicide	lbs a.i. Applied	# of Applications
Atrazine	412 lbs	74
Glyphosate	6,840 lbs	165
Hexazinone	20,260 lbs	140
Triclopyr	18,854 lbs	271
2,4-D	9,184 lbs	120

On the national forests, mechanical methods for treating competing vegetation continue to be used more than herbicides. On the national forests from 10/1/91 through 9/30/92 (the reporting period for the Forest Service), 56,680 acres of conifer plantation had some type of release treatment; of this total, only 9,344 acres were treated with herbicides. This represents about 15% of the total work. However, this also represents an herbicide program on six national forests in California, as compared to only one forest with an herbicide program in 1991. Table 10 lists total herbicide use on the national forests in California during the FY 1992 reporting period.

Table 10. Herbicides Applied on National Forestlands in California in 1992.

Herbicide	lbs a.i. applied	Acres Treated
Atrazine	18 lbs	6
Glyphosate	7,128 lbs	6,485
Hexazinone	7,767 lbs	2,759
Triclopyr	991 lbs	1,884
Total 1/		9,344

1/ The total acres treated is 9,344 because 1,790 acres were treated with a mixture of both Glyphosate and Triclopyr.

STATUS AND CONTROL OF ANIMAL PESTS

A Report to the California Forest Pest Council From the Animal Damage Commtittee

SCOTT WARNER, CHAIR
JOHN BORRECCO, SECRETARY

STATUS AND CONTROL OF ANIMAL PESTS

INTRODUCTION

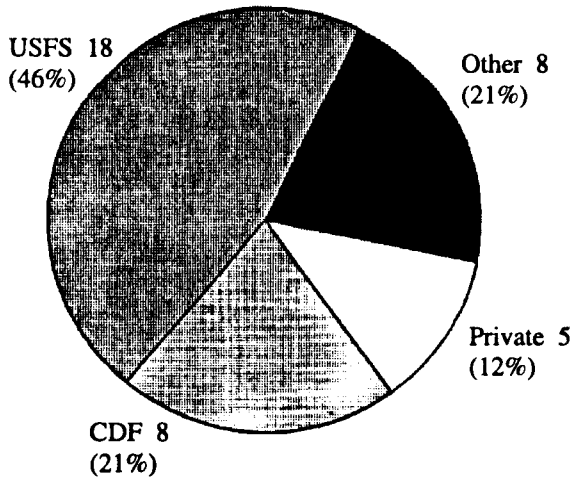
This report summarizes the Animal Damage Committee's annual survey of vertebrate damage to forest trees. The survey is accomplished by mailing a simple form to private timber companies, federal and state agencies, and other organizations who manage forested lands in California. The survey form requests summary information by pest species regarding species of trees injured, age class of trees, acres over which damage occurs, number of trees per acre damaged, whether damage occurs in plantations or other areas, the general trend in damage relative to past conditions, and control methods used. Results of this survey are reported as part of the California Forest Pest Council's annual overview of forest pest conditions in California.

In September, 1992, 104 survey forms were mailed to federal and state agencies, private timber companies, and other private organizations managing forested lands in California. A total of 39 (38% return) responses were received.

RESPONDENTS AND LOCATION OF REPORTS

Survey forms were returned by representatives of the U.S. Forest Service (n= 18); California Department of Forestry and Fire Protection (n=8); private timber companies (n=5); and various other organizations (n=8) including the National Park Service (3) and the Bureau of Land Management (5).

Figure 1. Organizations Returning Surveys



Incidence of damage to trees was reported from 34 counties representing over ¾ of the land area of California. Counties represented: Alpine, Amador, Butte, Calaveras, Del Norte, El Dorado, Fresno, Glenn, Humboldt, Kern, Lake, Lassen, Madera, Mariposa, Mendocino, Modoc, Mono, Nevada, Placer, Plumas, Riverside, San Bernardino, San Diego, Santa Cruz, Shasta, Sierra, Siskiyou, Sonoma, Tehama, Trinity, Tulare, Tuolumne, Ventura, and Yuba.

Figure 2. Counties Represented in Survey.

SPECIES CAUSING DAMAGE

A variety of mammal species are causing damage to forest trees and the damage varies by region of the state and by land ownership (Table 1). Species most commonly identified in this survey (as well as in previous years) as causing problems are deer (54% of respondents), pocket gopher (49%), domestic stock (38%), porcupine (31%), black bear (31%), and rabbits and hares (23%). Deer, pocket gophers and livestock feeding injuries on trees occur throughout the State on most ownerships. Damage by other species tends to be more limited geographically. No damage was reported for small seed-eating mammals.

TABLE 1. NUMBER OF DAMAGE RESPONSES REPORTED BY VERTEBRATE SPECIES (N = 39).

Species	USFS	CDF&FP	Private	other	Total
Beaver	2	0	0	0	2
Birds	0	1	0	0	1
Black bear	2	7	1	2	12
Deer	10	7	4	0	21
Woodrat	0	4	0	0	4
Elk	1	1	0	0	2
Meadow mice	1	0	0	0	1
Mountain beaver	2	1	0	0	3
Pocket gopher	13	3	2	1	19
Porcupine	8	3	1	0	12
Rabbits & hares	7	1	1	0	9
Tree Squirrels	2	3	0	0	5
Domestic stock	11	2	2	0	15
Ground squirrels	0	0	1	1	2
Total	59	33	12	4	108
(n)	(18)	(8)	(5)	(8)	(39)

SCOPE OF DAMAGE

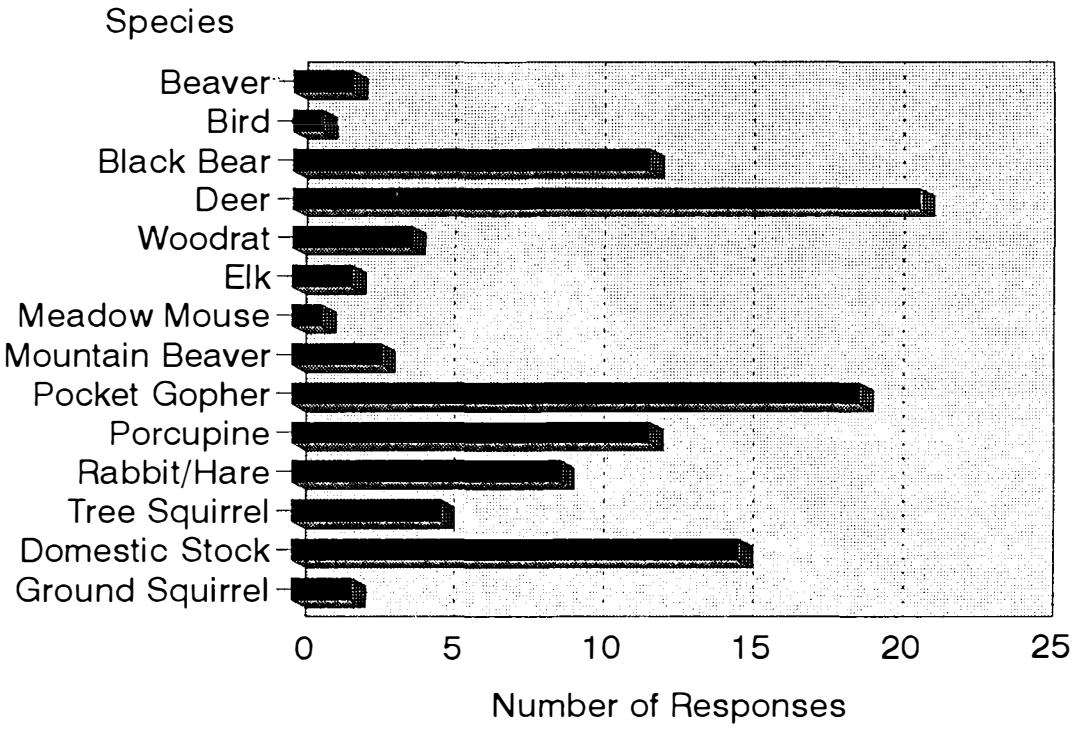
Damage from all sources was reported on about 147,411 acres (Table 2). All of California's major timber producing regions and timber types have reported damage by vertebrate species. Based on the acres of damage, the species ranking changes only slightly: black bear (34% of the acres), deer (21%), pocket gopher (18%), porcupine (10%), and domestic stock (6%), woodrat (7%), rabbits and hares (2%), and all others (2%).

TABLE 2. NUMBER OF ACRES REPORTED TO BE RECEIVING SOME LEVEL OF DAMAGE.

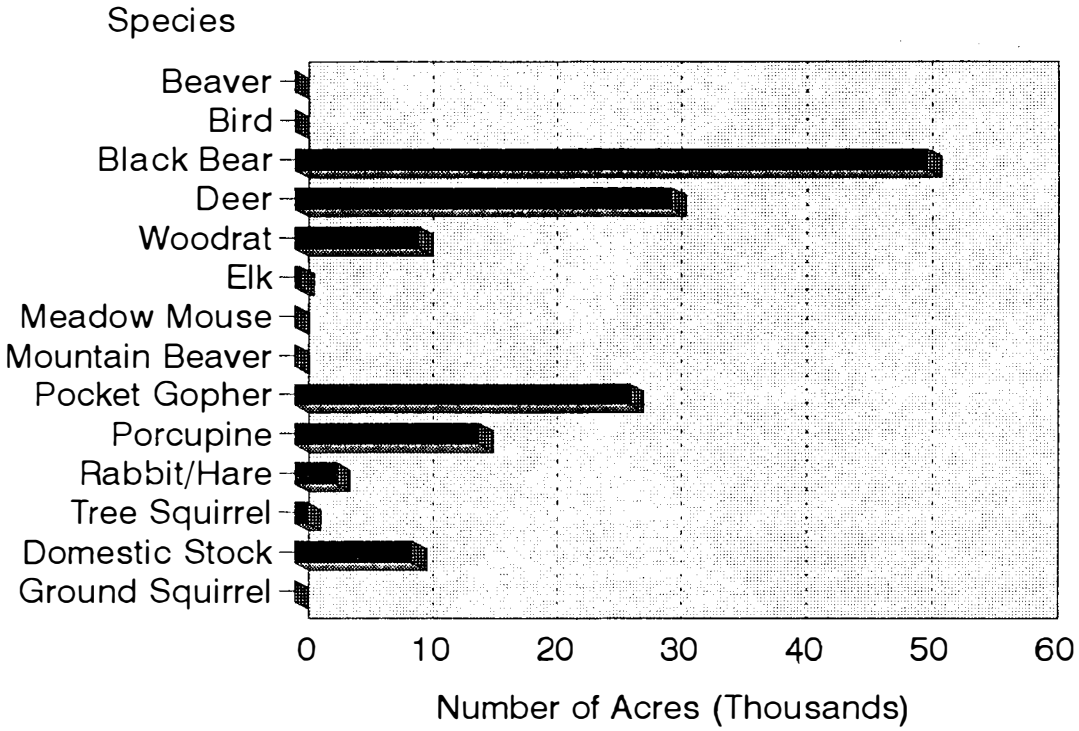
Species	USFS	CDF&FP	Private	Other	Total
Beaver	10	0	0	0	10
Birds	0		0	0	
Black bear	17	10,750	40,000	20	50,787
Deer	19,117	3,200	8,030	0	30,347
Woodrat	0	10,000	0	0	10,000
Elk	450	*	0	0	450
Meadow mice	100	0	0	0	100
Mountain beaver	75	*	0	0	75
Pocket gopher	25,902	500	520	40	26,962
Porcupine	11,735	3,000	100	0	14,835
Rabbits & hares	2,869	*	500	0	3,369
Tree Squirrels	1,005	*	0	0	1,025
Domestic stock	9,011	300	200	0	9,511
Feral pigs	0	0	0	0	0
Ground squirrels	0	0	2	2	4
Total	70,296	27,701	49,352	62	147,411
(%)	(48)	(19)	(33)	—	(100)

* incidence of damage reported but no information as to how many acres were affected.

Species Causing Damage



Acres Damaged



SPECIES ACCOUNTS

BEAVER

Species Damaged: Aspen.
Damage Trend: Static to increasing.
Control Methods: None (2/2).
Damage Location: Butte, Nevada, Placer, Plumas, Sierra, and Yuba Counties.
Comments: Damage reported to poles and smaller trees in streamside zones.

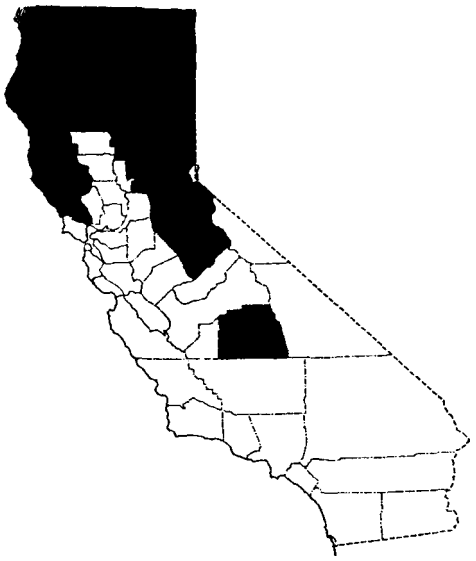
BIRDS

Species Damaged: Sugar pine.
Damage Trend: Static.
Control Methods: Netting, plastic owls, and sonic scaring (1/1).
Damage Location: Santa Cruz County.
Comments: Damage reported to seedlings in the Ben Lomond Nursery near Felton.

BEAR

Species Damaged: Douglas-fir, redwood, giant sequoia, ponderosa pine, red fir, and elder berry.
Damage Trend: Increasing.
Control Methods: Sport hunting (2/12), none (10/12).
Damage Location: Del Norte, Humboldt, Fresno, Madera, Mariposa, Riverside, San Bernardino, San Diego, Trinity, and Tulare Counties.
Comments: While damage was reported in both plantations and natural stands to trees of all ages, trees from 20 to 40 years old were most commonly damaged. Levels of damage vary from 1 to 20 trees/acre. Black bears are primarily a problem on private timber lands on the north coast of California, however a few incidences of bear damage were reported from the southern Sierra Nevada and southern California.

DEER



Species Damaged: Douglas-fir, redwood, ponderosa pine, Jeffrey pine, lodgepole pine, white fir, red fir, incense cedar, giant sequoia, and oak.
Damage Trend: Static to increasing.
Control Methods: Seedling protectors (12/21), repellents (2/21), planting larger stock (1/21), and none (7/21).
Damage Location: Alpine, Amador, Butte, Calaveras, Del Norte, El Dorado, Humboldt, Lake, Lassen, Mariposa, Mendocino, Modoc, Nevada, Placer, Plumas, Shasta, Sierra, Siskiyou, Sonoma, Tehama, Trinity, Tulare, Tuolumne, and Yuba Counties.
Comments: Most damage occurs to seedlings 1-5 years old in plantations. Levels of damage reported varied from 20 to 400 trees/acre. Seedling protectors include plastic mesh tubes, bud caps, and plastic mesh netting.

WOODRAT

Species Damaged: Douglas-fir, redwood, Sitka spruce, tanoak.
Damage Trend: Static.
Control Methods: None (4/4).
Damage Location: Del Norte, Humboldt, and Trinity Counties.
Comments: Damage to trees 10-30 years old. Woodrat damage is primarily reported from forests on the north coast of California. Generally considered a minor problem.

ELK

Species Damaged: Douglas-fir, white fir, redwood, ponderosa pine.
Damage Trend: Static.
Control Methods: None (2/2),
Damage Location: Del Norte, Humboldt, and Siskiyou Counties.
Comments: Damage occurs to seedlings and saplings at levels of 2 to 300 trees/acre. Injuries by trampling and rubbing were reported in addition to feeding injuries.

MEADOW MOUSE

Species Damaged: Ponderosa and Jeffrey pine.
Damage Trend: Increasing.
Control Methods: None (1/1).
Damage Location: Butte, Lassen, Plumas, Shasta, and Tehama Counties
Comments: Damage reported to be occurring in plantations on about 20 seedlings/acre.

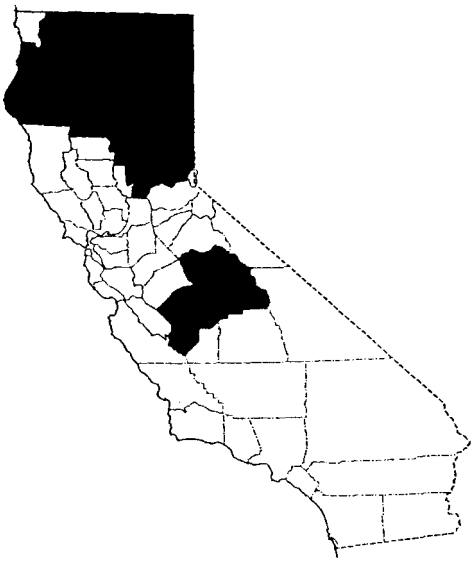
MOUNTAIN BEAVER

Species Damaged: Douglas-fir, grand fir, red fir, white fir, sugar pine, and Sitka spruce.
Damage Trend: Static.
Control Methods: None (3/3).
Damage Location: Del Norte, Humboldt and Siskiyou Counties.
Comments: Most damage occurs in plantations to seedlings 1-10 years old. Some injury to riparian vegetation also reported.

POCKET GOPHER

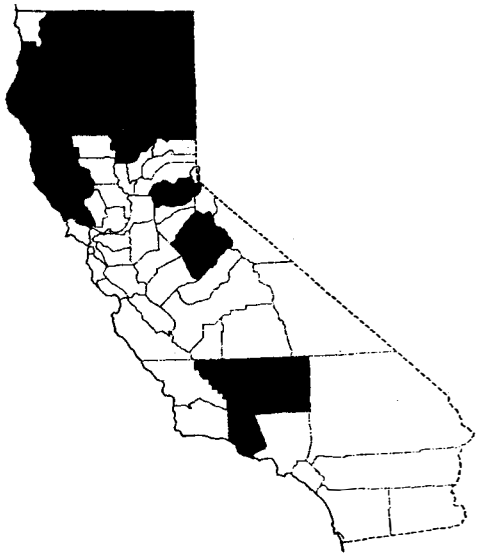
Species Damaged: Douglas-fir, white fir, red fir, ponderosa pine, Jeffrey pine, Coulter pine, sugar pine, redwood, incense cedar.
Damage Trend: Static to increasing.
Control Methods: Strychnine bait (6/19), trapping (1/19), none (12/19).
Damage Location: Alpine, Amador, Butte, Calaveras, El Dorado, Fresno, Humboldt, Lassen, Madera, Mariposa, Modoc, Mono, Neveda, Placer, Plumas, San Diego, Shasta, Sierra, Siskiyou, Tehama, Trinity, Tulare, Tuolumne, and Yuba Counties.
Comments: Most damage to seedlings in plantations 1 to 10 years old. Levels of damage reported range from 5-600 trees/acre. This is the number one vertebrate pest on National Forest lands in terms of both acres with damage and number of respondents.

PORCUPINES



Species Damaged: Douglas-fir, white fir, ponderosa pine, Jeffrey pine, lodgepole pine and redwood.
Damage Trend: Static.
Control Methods: Hunting (3/12), seedling protectors (1/12), none (9/12).
Damage Location: Butte, Fresno, Lassen, Madera, Mariposa, Modoc, Nevada, Placer, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity and Yuba Counties.
Comments: Seedlings to mature trees reported damaged with levels of damage ranging from 1 to 150 trees/acre.

RABBIT & HARE

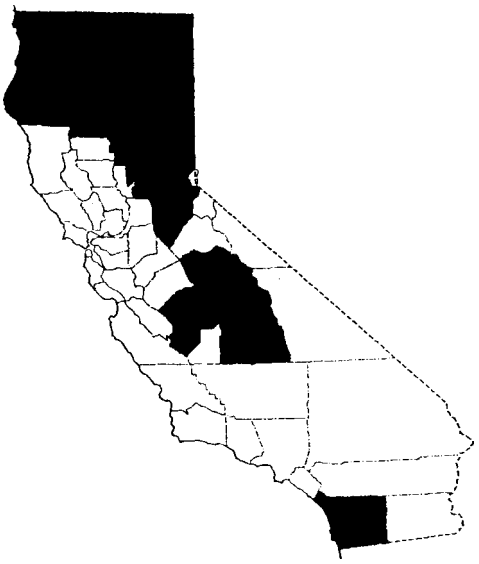


Species Damaged: Douglas-fir, white fir, red fir, ponderosa pine, Jeffrey pine, lodgepole pine, western white pine.
Damage Trend: Static to increasing.
Control Methods: Seedling protectors (6/9), none (3/9).
Damage Location: Butte, El Dorado, Humboldt, Kern, Lake, Lassen, Mariposa, Mendocino, Modoc, Plumas, Shasta, Siskiyou, Sonoma, Tehama, Trinity, Tuolumne, and Ventura Counties.
Comments: Damage to seedlings 1-5 years old in plantations. Levels of damage reported range from 1 to 350 trees/acre.

TREE SQUIRREL

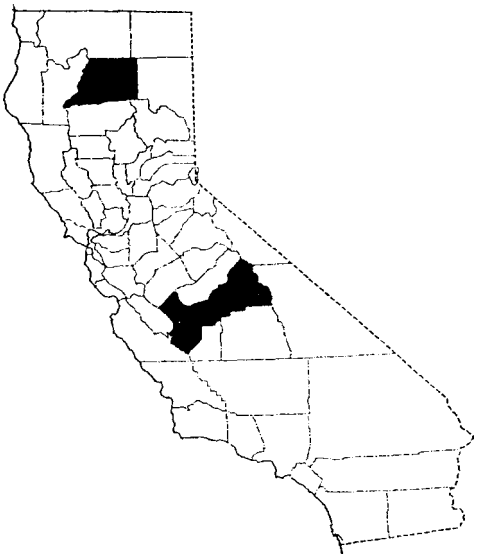
Species Damaged: Redwood, ponderosa pine, Douglas-fir, Pinyon pine, maple.
Damage Trend: Static to increasing.
Control Methods: Hunting (1/5), seedling protectors (1/5), none (3/5).
Damage Location: Humboldt, Kern, Mendocino, Siskiyou, Trinity and Ventura Counties.
Comments: Damage is generally to trees 10 to 60 years old.

DOMESTIC STOCK



Species Damaged: Douglas-fir, white fir, red fir, redwood, ponderosa pine, Jeffrey pine, lodgepole pine, western white pine, incense cedar, black oak.
Damage Trend: Static to increasing.
Control Methods: Placement of salt (1/15), seedling protectors (3/15), fencing (4/15), allotment plan to regulate numbers (1/15), none (9/15).
Damage Location: Amador, Butte, Calaveras, Del Norte, El Dorado, Fresno, Humboldt, Lassen, Madera, Mariposa, Modoc, Nevada, Placer, Plumas, San Diego, Shasta, Sierra, Siskiyou, Tehama, Trinity, Tulare, Yuba Counties.
Comments: Most respondents reported damage to seedlings and saplings 1-10 years old in plantations. Levels of damage varied from 5 to 300 trees/acre.

GROUND SQUIRREL



Species Damaged: Ponderosa pine and valley oak.
Damage Trend: Increasing.
Control Methods: Trapping (1/2) and none (1/2).
Damage Location: Fresno and Shasta Counties.
Comments: Damage is most significant on mature trees in developed recreation sites although damage to seedlings (1-0 years old) also reported in a plantation. Squirrels undermine roots and expose them to disease and moisture stress.

SURVEYS AND EVALUATIONS

A REPORT TO THE CALIFORNIA FOREST PEST COUNCIL
FROM THE INSECT AND DISEASE COMMITTEES

SURVEYS AND EVALUATIONS

DEMONSTRATION THINNING PLOTS IN THE EASTSIDE PINE TYPE ON THE LASSEN NATIONAL FOREST.

In 1978-1979 the Forest Service established plots in the eastside pine type to show the effects of thinning on pest-caused losses in areas of high tree mortality. The stands chosen were mostly pole-size ponderosa pine mixed with some white fir and incense-cedar, growing on medium to low sites, and ranging in age from 70 to 90 years. Within the demonstration plots, four levels of stocking density—40, 55, 70, and 100 percent of normal basal area—were established to demonstrate the biological and economic alternatives available for management planning. (Normal basal area is the basal area that a stand should have reached when fully stocked with trees, which in the demonstration areas, ranges from 185 to 215 sq ft/ac, depending on site quality.) Thirteen years after thinning, the treatments had reduced mortality from 89 to 100 percent of the level in unthinned stands (Table 11).

Table 11. Commercial tree mortality by stocking level, thirteen years after thinning[a]

	Residual Stocking After Thinning[b]			
	40%	55%	70%	100%
Year	Trees per Acre			
1980	0.0	0.2	0.2	2.4
1981	0.0	0.0	0.7	2.4
1982	0.0	0.5	0.3	3.6
1983	0.0	0.1	0.8	4.1
1984	0.0	0.0	0.0	1.0
1985	0.0	0.2	0.0	0.6
1986	0.0	0.0	0.0	1.3
1987	0.0	0.0	0.0	1.4
1988	0.0	0.0	0.0	0.0
1989	0.0	0.4	0.0	2.6
1990	0.0	0.0	0.0	2.6
1991	0.0	0.0	0.0	1.8
1992	0.0	0.2	0.0	1.3
Mean	0.0	0.1	0.2	1.9
Range	0	0 - .5	0 - .8	0 - 4.1
Percent Mortality Reduction Compared with Normal Basal Area				
	100	95.0	89.0	—

a. Commercial trees are 8 inches dbh and larger, with straight boles, yielding at least one 10-foot log with a 6-inch top. Trees were killed by the mountain pine beetle.

b. Percent of normal basal area.

AIR POLLUTION

Twenty-five ozone injury trend plots established in 1977 on the Sequoia National Forest (Fresno, Tulare, and Kern Counties) were revisited and rated for foliar injury due to air pollution. These plots were last evaluated in 1990. During the past two years injury increased at 8 sites, decreased at 11 sites, and remained the same at 6 sites. The general trend between 1979 and 1985 when precipitation was near normal was for a gradual increase in the amount of ozone injury to pines. During the past 6 years of drought in the southern Sierra Nevada, however, the trend has been one of decreasing injury. It is theorized that pines under moisture stress are less active physiologically and therefore take up less ozone. While this may seem to be a beneficial situation, many stressed pines, whether damaged by ozone or not, have been decimated by bark beetles.

FOREIGN LOG IMPORTS

Radiata pine (*Pinus radiata*) imported from New Zealand arrived in San Francisco and the Port of Sacramento. Logs were eventually hauled to Marysville Forest Products, Marysville; Louisiana-Pacific, Oroville; and Schmidtbauer Lumber Company, Eureka. *Sphaeropsis sapinea* (=*Diplodia pinea*) was recovered from freshly milled logs at each location. The fungus was not recovered from kiln-dried wood at these locations. No other diseases and no insects were found during these inspections.

Chilean hardwood logs imported by Fiberboard Corporation arrived in Standard, California. The logs, *Nothofagus dombeyi* and *Laurelia philippiana*, were previously fumigated with methyl bromide and aired out for five days prior to shipment from Los Angeles to Standard. No signs of insects or insect activity were noted. Internal samples were taken from each of ten logs selected for sampling because they had either signs of decay or surface defects. Surface contaminants were also collected for identification. All samples were taken to Sacramento for identification and analysis by CDFA (California Department of Food and Agriculture).

MISTLETOES

Dwarf Mistletoes. Approximately 1,500 acres on Mt. Shasta Ranger District, Shasta-Trinity National Forests (Shasta and Siskiyou Counties) were surveyed for dwarf mistletoe around and within regeneration units. The purpose of the survey is to determine needs and priorities for suppression efforts.

Dwarf mistletoe continues to spread and degrade Jeffrey and ponderosa pines in the high value recreation areas of southern California. Three suppression projects are underway: (1) pruning and felling of mistletoe-infested trees at Crystal Lake Campgrounds, Mt. Baldy Ranger District, Angles National Forest (Los Angeles County); (2) broom pruning, branch pruning, and tree

removal on 800 acres on the Arrowhead, Big Bear, San Gorgonio, and San Jacinto Ranger Districts, San Bernardino National Forest (San Bernardino County); and (3) branch pruning, broom pruning, and felling at Mt. Pinos Recreation Area and Organization Camps on the Mt. Pinos District, Los Padres National Forest (Ventura County). These projects were begun last year and are expected to be completed in 1995.

Pre-suppression surveys were initiated in areas burned by wildfire in the 1987 Stanislaus Complex Fire (Tuolumne and Mariposa Counties). The purpose is to identify potential problem areas where infected residuals either within or adjacent to young plantations might threaten regeneration and, therefore, require treatment.

Field tests are continuing with the selections of Jeffrey pines resistant to dwarf mistletoe. Plots established in 1991 on the Sugar Pine, Emerald Bay, and Grover Hot Springs State Parks continue to be monitored. Also, additional, plantings of resistant selections will be made on the San Bernardino National Forest in the spring of 1993.

Investigations are also underway by the Chico Tree Improvement Center and the El Dorado National Forest to develop and test several selections of ponderosa pine to dwarf mistletoe.

True Mistletoes. True mistletoe demonstration control projects were evaluated for the second year in hardwoods at Lytle Creek Ranger Station, Apple White Campground, and Apple White Day Use Area, Cajon Ranger District, San Bernardino National Forest, and Crystal Lake Campground, Mt. Baldy Ranger District, Angeles National Forest (Los Angeles County). Demonstration control projects for true mistletoe in conifers were evaluated at Pinyon Flats and Fern Basin Campgrounds, San Jacinto Ranger District, San Bernardino National Forest (San Bernardino County). The data suggest that both chemical and silvicultural treatments can effectively reduce the reproduction and spread of true mistletoes on hardwoods and conifers in recreation areas for at least' two years.

MYCORRHIZAE

Mycorrhiza inoculation monitoring on the Salmon River Ranger District

Salmon River Ranger District, Klamath National Forest (Siskiyou County), initiated a study of the effect of mycorrhizal inoculation on outplanting seedling growth and survival. The purpose of the study is to determine whether such inoculation increases mycorrhizal infection and provides a survival/growth benefit to ponderosa pine seedlings on harsh sites, to ponderosa pine seedlings on green sale sites, or to Douglas-fir seedlings on green sale sites. USDA-FS Forest Pest Management (Northern CA Service Area, Redding) is assisting the District with monitoring the effectiveness of the inoculations.

Plots were established in spring 1992 on two areas of the District. Nine pine plots were established on the Picayune Ridge portion of the area burned by the 1977 Hogg fire, which reburned in 1987 (near Forks of the Salmon). This area typifies harsh, difficult-to-regenerate conditions that result from repeated wildfire. Four pine plots were established on two units of the Blind Horse Sale area (near Cecilville), which had been hand-piled and broadcast burned in 1991 in preparation for replanting in 1992. This sale area typifies a higher site quality, green sale site. Nine Douglas-fir plots were also established on three units of the Blind Horse sale area.

150,000 Douglas-fir bareroot seedlings and 250,000 ponderosa pine bareroot seedlings were inoculated with a spore suspension of *Rhizopogon* sp. during the 1992 planting season. Seedlings were inoculated by incorporating the spore suspension into the vermiculite and water slurry into which roots are dipped prior to planting.

Evaluation will be done by measuring growth and survival on inoculated and non-inoculated control seedlings in the plots. Root systems will also be examined to determine if the inoculation resulted in colonization of the seedlings by the fungus.

Mycorrhiza inoculation monitoring on the McCloud Ranger District. McCloud Ranger District (Shasta-Trinity National Forests) (Siskiyou, Shasta Counties), Forest Pest Management (Northern CA Service Area), the National Audubon Society, and the mushroom culture industry have jointly implemented a study on Forest Service lands to determine whether inoculation with mycorrhizae at the time of planting may help in survival and growth of ponderosa pine seedlings on sites typical of difficult sites on the District. In order to determine whether one form of inoculum is more suitable or beneficial than others, three forms of inoculum were used. These were spores of *Rhizopogon occidentalis* in the root dip slurry, spores of *Pisolithus tinctorius* in the slurry, and addition to the planting hole of soil gathered from near healthy mycorrhizal ponderosa pine trees in the vicinity.

Four 0.5 acre plots were established in spring 1992. Three units in the Bear Mountain Compartment on which plantations have failed were selected for the study. The units have not been forested for some time, and represent situations where inoculum potential is likely to be low. Competing vegetation (rabbitbrush and grasses) and animal damage (gophers) have contributed to past failures on these units. Each plot was hand-planted with 25 randomly arranged seedlings of each treatment (3 inoculation treatments and 1 non-inoculation treatment). Each tree was re-measured annually for 3 years to determine differences in growth or survival.

WHITE PINE BLISTER RUST

The USDA-Forest Service Forest Pest Management group initiated a survey of sugar pine occurrence and condition in California. A pilot survey was conducted this summer with the following objectives: (1) test the methodology and overall feasibility of the pilot survey design and (2) acquire enough data to conduct test analyses to confirm that useful and valid conclusions can be drawn from the data collected. Personnel from the Forest Service Tree Improvement Program, Forest Service Research, and the California Department of Forestry and Fire Protection provided major assistance.

A subsample of Forest Service forest inventory and analysis (FIA) plots containing sugar pine were relocated on the ground, and a new ¾-acre fixed-radius plot established at the same site. All sugar pine greater than 1" DBH on the plot were inventoried, as well as seedlings on a nested ½-acre plot. All major life- and growth-threatening damage present on the trees was recorded, along with detailed information on white pine blister rust when that disease was identified.

Data were recorded for 146 sugar pine on 16 plots on the Shasta-Trinity National Forests, and for 270 sugar pine on 24 plots on the Sequoia National Forest. The field effort was accomplished through the efforts of twelve individuals who contributed a total of 76 person-days (including travel time to and from official duty stations). The results of the pilot survey will be published in a USDA-Forest Service Biological Evaluation.

TABLE 12. CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE, TREE DIAGNOSES FROM JANUARY THROUGH NOVEMBER 1992.

HOST TREE	DIAGNOSIS	COUNTY
ABIES MAGNIFICA RED FIR SEEDLINGS	*FUSARIUM MONILIFORME* SEEDLING ROT	SANTA CRUZ
ABIES MAGNIFICA RED FIR SEEDLINGS	*FUSARIUM OXYSPORUM* FUSARIUM BLIGHT	SANTA CRUZ
ACER PALMATUM DWARF JAPANESE MAPLE	*VERTICILLIUM DAHLIAE* VERTICILLIUM WILT	SANTA CLARA, HUMBOLDT, CONTRA COSTA, SAN MATEO
ARAUCARIA ARAUCANA MONKEY PUZZLE	PHYSIOLOGICAL OEDEMA	SONOMA
BETULA ALBA WHITE BIRCH	*PHORADENDRON MACROPHYLLUM* BROADLEAF MISTLETOE	SACRAMENTO
CARYA ILLINOENSIS PECAN	PHYSIOLOGICAL HEAT SCORCH	TEHAMA
CASUARINA EQUISETIFOLIA BEEFWOOD SEEDLINGS	*FULIGO SEPTICA* EPIPHYTIC MYXOMYCETE	YOLO
CERATONIA SILIQUA CAROB FLOWER	NORMAL "GALLS" WHICH ARE OLD STALK ATTACHMENTS	LOS ANGELES
CINNAMOMUM CAMPHORA CAMPHOR	HEAT STESS/BURN	SAN MATEO
CORNUS FLORIDA EASTERN DOGWOOD	*DISCULA* SP. FOLIAR BLIGHT	LOS ANGELES
CORNUS FLORIDA EASTERN DOGWOOD	*SEPTORIA CORNIA* LEAFSPOT	PLACER
CRYPTOMERIA JAPONICA CRYPTOMERIA	*PHYTOPHTHORA SP.* CROWN ROT	SANTA BARBARA
CUPRESSUS SP. CYPRESS	*SEIRIDIUM CARDINALE* CYPRESS CANKER	CONTRA COSTA
CUPRESSUS GLABRA ARIZONA CYPRESS SEEDLINGS	*FULIGO SEPTICA* EPIPHYTIC MYXOMYCETE	YOLO
ERIOBOTRYA JAPONICA LOQUAT	*ENTOMOSPORIUM MESPILI* LEAF SPOT	SAN MATEO
EUCALYPTUS VIMINALIS MANNA GUM	*PHYTOPHTHORA SP.* CROWN ROT	TEHAMA
FRAXINUS OXYCARPA 'RAYWOOD' RAYWOOD ASH	*DIPLODIA MUTILA* CANKER/FACULTATIVE PARASITE	SOLANO
FRAXINUS VELUTINA VAR. *GLABRA*, MODESTO ASH	*DISCULA FRAXINEA* ASH ANTHRACNOSE	SACRAMENTO

Table 12 (Cont.)

HOST TREE	DIAGNOSIS	COUNTY
JUGLANS REGIA ENGLISH WALNUT	*SCHIZIPHYLLUM COMMUNE* WOOD DECAY	SACRAMENTO
LAGERSTROEMIA INDICA CREPE MYRTLE	PHYSIOLOGICAL OEDEMA	PLACER
LIQUIDAMBAR STYRACIFLUA LIQUIDAMBAR	"WINGS", NORMAL FASCIATIONS ON THE TWIGS	SACRAMENTO
LIRIODENDRON TULIPIFERA TULIP TREE	*OIDIUM SP.* POWDERY MILDEW, ASEXUAL STAGE	SANTA CLARA
LIRIODENDRON TULIPIFERA TULIP TREE	WIND DESSICATION	SACRAMENTO
MALUS SYLVESTRIS APPLE	*VENTURIA INAEQUALIS* APPLE SCAB	HUMBOLDT
MORUS ALBA var.'FRUITLESS' FRUITLESS MULBERRY	*CYTOSPORA CHRYSOSPERMA* CYTOSPORA CANKER	SACRAMENTO
MORUS ALBA var. 'FRUITLESS' FRUITLESS MULBERRY	HERBICIDE INJURY	SACRAMENTO
MORUS ALBA var. 'FRUITLESS' FRUITLESS MULBERRY	*SCHIZOPHYLLUM COMMUNE* WOOD DECAY FUNGUS	CONTRA COSTA
OLEA EUROPAEA OLIVE	*SPILOCAEA OLEAGINEA* PEACOCK SPOT OF FOLIAGE	SAN MATEO
PINUS RADIATA MONTEREY PINE	*ENDOCRONARTIUM HARKNESSII* WESTERN GALL RUST	SANTA CLARA, SAN MATEO
PINUS RADIATA MONTEREY PINE	*FUSARIUM SUBGLUTINANS* PINE PITCH CANKER	SANTA BARBARA, SANTA CRUZ, MONTEREY, SAN MATEO
PLATANUS OCCIDENTALIS CALIFORNIA SYCAMORE	PHENOXY HERBICIDE INJURY	SACRAMENTO
PLATANUS X *ACERIFOLIA* LONDON PLANE TREE	*BOTRYOSPHAERIA RIBIS* CANKER	LOS ANGELES
PLATANUS X *ACERIFOLIA* LONDON PLANE TREE	*MICROSPHAERA PENICILLATA* POWDERY MILDEW	SANTA CLARA
POPULUS FREMONTII COTTONWOOD	FLATHEADED BORER INJURY	NEVADA
POPULUS SP. POPLAR	*MARSSONINA POPULINA* LEAFSPOT	LOS ANGELES
PRUNUS ARMENIACA APRICOT	PRUNE DWARF VIRUS	MERCED

Table 12 (Cont.)

HOST TREE	DIAGNOSIS	COUNTY
PRUNUS ARMENIACA APRICOT	PRUNUS NECROTIC RINGSPOT VIRUS	MERCED
PRUNUS AVIUM SWEET CHERRY	*PHYTOPHTHORA SP.*	YUBA
PRUNUS DOMESTICA PLUM	PLUM LINE PATTERN VIRUS	CONTRA COSTA
PRUNUS DOMESTICA PLUM	*PSEUDOMONAS SYRINGE PV. SYRINGE* bacterial canker	SAN JOAQUIN
PRUNUS PERSICA PEACH	*MONILINIA FRUCTICOLA* STONE FRUIT BROWN ROT	SACRAMENTO
PRUNUS PERSICA PEACH	*TAPHRINA DEFORMANS* PEACH LEAF CURL	SACRAMENTO
PRUNUS PERSICA var. *NECTARINA,* NECTARINE	*TAPHRINA DEFORMANS* PEACH LEAF CURL	SACRAMENTO
PRUNUS VIRGINIANA CHOKECHERRY	*APIOSPORINA MORBOSA* BLACK KNOT	PLACER
PSEUDOTSUGA MENZIESII DOUGLAS-FIR LUMBER	*SERPULA LACRIMANS* DRY ROT FUNGUS	SACRAMENTO
PSEUDOTSUGA MENZIESII DOUGLAS-FIR SEEDLING	*FUSARIUM OXYSPORUM* UNKOWN PATHOGENICITY	SANTA CRUZ
PSEUDOTSUGA MENZIESII DOUGLAS-FIR SEEDLINGS	*PHYTOPHTHORA SP.* PHYTOPHTHORA ROOT ROT	BUTTE, SANTA CRUZ
PYRUS KAWAKAMI ORNAMENTAL PEAR	*ENTOMORSPORIUM MESPILI* ENTOMOSPORIUM LEAF SPOT	SANTA CRUZ
QUERCUS AGRIFOLIA COAST LIVE OAK SEEDLINGS	*CYSTOTHECA LANESTRIS* POWDERY MILDEW	SANTA CLARA
QUERCUS AGRIFOLIA COAST LIVE OAK	*CYSTOTHECA LANESTRIS* POWDERY MILDEW	SANTA CLARA
QUERCUS AGRIFOLIA COAST LIVE OAK	*GANODERMA LUCIDUM* HEART AND ROOT ROT	SANTA CLARA
QUERCUS AGRIFOLIA COAST LIVE OAK	*TAPHRINA CAERULESCENS* OAK LEAF BLISTER	SAN MATEO, SANTA CRUZ
QUERCUS DOUGLASII BLUE OAK	*DALDINIA GRANDIS* WOOD DECAY FUNGUS	NEVADA
QUERCUS DOUGLASII BLUE OAK	*GANODERMA APPLANATUM* HEART ROT/WOOD DECAY	SACRAMENTO

Table 12 (Cont.)

HOST TREE	DIAGNOSIS	COUNTY
QUERCUS DOUGLASII BLUE OAK	OAK BARK BEETLE INJURY	SACRAMENTO
QUERCUS DOUGLASII BLUE OAK	TWIG GIRDLER WASP INJURY	SACRAMENTO
QUERCUS ENGLEMANNII ENGLEMAN OAK	*SPHAEROTHECA LANESTRIS* POWDERY MILDEW	SAN JOAQUIN
QUERCUS KELLOGGII CALIFORNIA BLACK OAK	*ARMILLARIA MELLEA* OAK ROOT FUNGUS	NEVADA
QUERCUS KELLOGGII CALIFORNIA BLACK OAK	*DALDINIA GRANDIS* WOOD DECAY FUNGUS	NEVADA
QUERCUS KELLOGGII CALIFORNIA BLACK OAK	*GANODERMA APPLANATUS* HEART ROT/WOOD DECAY	NEVADA
QUERCUS KELLOGGII CALIFORNIA BLACK OAK	*STEREUM HIRSUTUM* DECAY FUNGUS	NEVADA
QUERCUS LOBATA VALLEY OAK SEEDLINGS	*SPHAEROTHECA LANESTRIS* POWDERY MILDEW	SANTA CLARA
QUERCUS LOBATA VALLEY OAK	*CORYNEUM DEPRESSUM* BRANCH CANKER	SAN JOAQUIN
QUERCUS LOBATA VALLEY OAK	*CYSTOTHECA LANESTRIS* POWDERY MILDEW	SANTA CLARA
QUERCUS LOBATA VALLEY OAK	*CYSTOTHECA LANESTRIS* POWDERY MILDEW	SANTA CLARA
QUERCUS LOBATA VALLEY OAK	*DIPLODIA QUERCINA* BRANCH CANKER	SAN JOAQUIN
SALIX BABYLONICA WEEPING WILLOW	*COLLETOTRICHUM GLOEOSPORIOIDES* FACULTATIVE TWIG PARASITE	HUMBOLDT
SCHINUS TERIBITHIFOLIUS BRAZILIAN PEPPER	*OIDIUM SP.* POWDERY MILDEW	MADERA
SEQUOIA SEMPERVIRENS COAST REDWOOD	*PHYTOPHTHORA SP.* PHYTOPHTHORA ROOT ROT	HUMBOLDT
ULMUS AMERICANA AMERICAN ELM	*ARMILLARIA MELLEA* OAK ROOT FUNGUS	SACRAMENTO
ULMUS PARVIFOLIA CHINESE ELM	*GLOEOSPORIUM ULMICOLA* ANTHRACNOSE	LOS ANGELES
UMBELLULARIA CALIFORNICA CALIFORNIA BAY	*GANODERMA APPLANATUM* HEART ROT/WOOD DECAY	SAN MATEO

UNITED STATES DEPARTMENT OF AGRICULTURE - FOREST SERVICE

CALIFORNIA FOREST PEST COUNCIL

FOREST PEST DETECTION REPORT

I. FIELD INFORMATION (See instructions on reverse)

1. COUNTY:

2. FOREST (FS ONLY):

3. DISTRICT (FS ONLY):

4. LEGAL DESCRIPTION:
T. _____ R. _____
section (s) _____

5. DATE:

6. LOCATION:

7. LANDOWNERSHIP:
- FOREST SERVICE
- OTHER FEDERAL
- STATE
- PRIVATE

8. SUSPECTED CAUSE(S) OF INJURY:
1. INSECT
2. DISEASE
3. ANIMAL
4. WEATHER
5. CHEMICAL
6. MECHANICAL
7. WEED
8. UNKNOWN

9. SIZE(S) OF TREES AFFECTED:
1. SEEDLING
2. SAPLING
3. POLE
4. SAWTIMBER
5. OVERMATURE

10. PART(S) OF TREE AFFECTED:
1. ROOT
2. BRANCH
3. LEADER
4. BOLE
5. TWIG
6. FOLIAGE
7. BUD
8. CONE

11. SPECIES AFFECTED:

12. NUMBER AFFECTED:

13. ACRES AFFECTED:

14. INJURY DISTRIBUTION:
1. SCATTERED
2. GROUPED

15. STATUS OF INJURY:
1. DECREASING
2. STATIC
3. INCREASING

16. ELEVATION:

17. PLANTATION?
1. YES
2. NO

18. STAND COMPOSITION (SPECIES):

19. STAND AGE AND SIZE CLASS:

20. STAND DENSITY (BASAL AREA):

21. SITE QUALITY:

22. PEST NAMES (IF KNOWN) AND REMARKS (SYMPTOMS AND CONTRIBUTING FACTORS):

23. SAMPLE FORWARDED?
1. YES
2. NO

24. ACTION REQUESTED:
1. INFORMATION ONLY
2. LAB IDENTIFICATION
3. FIELD EVALUATION

25. REPORTER'S NAME:

26. REPORTER'S AGENCY:

27. REPORTER'S ADDRESS & PHONE NUMBER:

II. REPLY (PEST MANAGEMENT USE)

28. RESPONSE:

29. REPORT NUMBER:

30. DATE:

31. EXAMINER'S SIGNATURE:

THE COOPERATIVE FOREST PEST DETECTION SURVEY is sponsored by the California Forest Pest Council. The Council encourages federal, state, and private land managers and individuals to contribute to the Survey by submitting pest injury reports and samples in the following manner.

FEDERAL PERSONNEL. Send all detection reports through channels. Mail injury samples with a copy of this report to one of the following appropriate offices:

USDA Forest Service
State and Private Forestry
630 Sansome Street
San Francisco, CA 94111

Forest Pest Management
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, CA 96001

Forest Pest Management
Stanislaus National Forest
19777 Greenley Road
Sonora, CA 95370

STATE PERSONNEL. Send all detection reports through channels. Mail injury samples with a copy of this report to one of the following appropriate offices:

California Dept. of Forestry
and Fire Protection
P.O. Box 1590
Davis, CA 95617

California Dept. of Forestry
and Fire Protection
6105 Airport Road
Redding, CA 96002

California Dept. of Forestry
and Fire Protection
776 S. State Street, #107
Ukiah, CA 95482-5891

PRIVATE LAND MANAGERS AND INDIVIDUALS. Send all detection reports and samples to the closest California Department of Forestry and Fire Protection office listed above.

COMPLETING THE DETECTION REPORT FORM

HEADING (BLOCKS 1-7). Enter all information requested. In Block 6, LOCATION, provide sufficient information for the injury center to be relocated. If possible, attach a location map to this form.

INJURY DESCRIPTION (BLOCKS 8-15). Check as many boxes as are applicable, and fill in the requested information as completely as possible.

STAND DESCRIPTION (BLOCKS 16-21). This information will aid the examiner in determining how the stand conditions contributed to the pest situation. In Block 18, indicate the major tree species in the overstory and understory. In Block 19, indicate the stand age in years, and/or the size class (seedling-sapling; pole; young sawtimber; mature sawtimber; overmature, or decadent).

PEST NAMES (BLOCK 22). Write a detailed description of the pest or pests, the injury symptoms, and any contributing factors.

ACTION REQUESTED (BLOCK 24). Mark "Field Evaluation" only if you consider the injury serious enough to warrant a professional evaluation. Mark "Information Only" if you are reporting a condition that does not require further attention. All reports will be acknowledged and questions answered on the lower part of this form.

REPLY (SECTION II). Make no entries in this block; for examining personnel only. A copy of this report will be returned to you with the information requested.

HANDLING SAMPLES. Please submit injury samples with each detection report. If possible, send several specimens illustrating the stages of injury and decline. Keep samples cool and ship them immediately after collection. Send them in a sturdy container, and enclose a completed copy of the detection report.

YOUR PARTICIPATION IN THE COOPERATIVE FOREST PEST DETECTION SURVEY IS GREATLY NEEDED AND APPRECIATED. Additional copies of this form are available from the Forest Service, Forest Pest Management, and from the California Department of Forestry and Fire Protection.

CALIFORNIA FOREST PEST COUNCIL
COUNCIL AND COMMITTEE OFFICERS, 1992

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Council Vice-Chair: Dave Burns (RPF – Sacramento)
Council Secretary: Susan Frankel (USDA Forest Service – San Francisco)

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Secretary: John Borrecco (USDA Forest Service – San Francisco)

Disease Committee:
Chair: Jesse Rios (CDF – Sacramento)
Secretary: Jack Marshall (CDF – Ukiah)

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Secretary: Jeanette Needham (CDF – Ukiah)

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Chair: Dave Neff (CDF – Riverside)
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Editor-in-Chief: Allen Robertson (CDF – Sacramento)

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The Executive Committee is composed of the Council Chair, Vice-Chair, Council Secretary, the Standing Committee Chairs (6), and the following members-at-large (3) :

- Herb Baldwin (Roseburg Resources Co. – Anderson)
- George Ferrell (USDA FS PSW – Redding)
- Ron Thompson (USDA APHIS ADC – Sacramento)